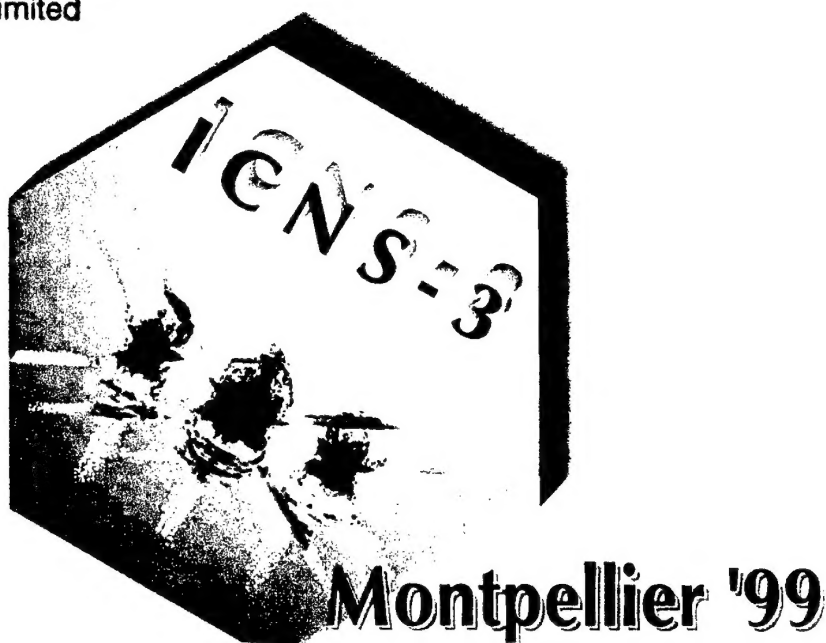


**The Third International Conference  
on  
Nitride Semiconductors**

**ICNS3**

**DISTRIBUTION STATEMENT A**  
Approved for Public Release  
Distribution Unlimited

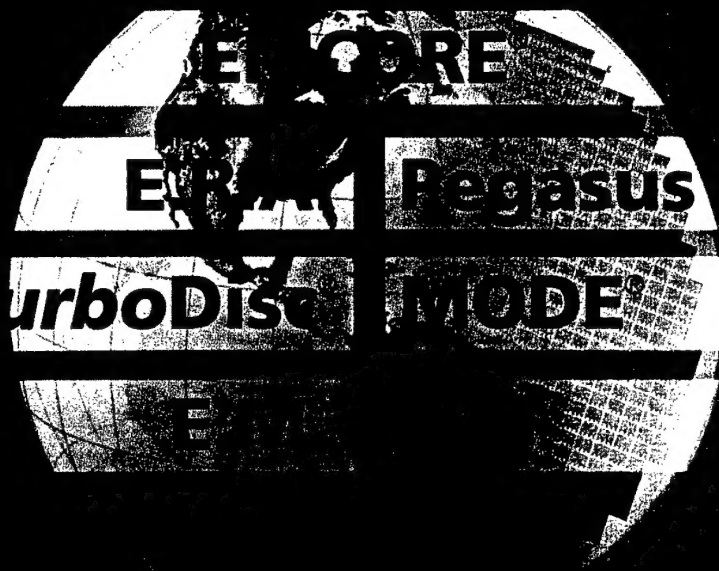


**19991004 215**

**Montpellier, France  
July 4-9, 1999**

**PROGRAMME**

# Resources to Fuel the Evolution



EMCORE Corporation is the leading provider of integrated compound semiconductor solutions. Due to superior uniformity, reliability and throughput, prominent manufacturers throughout the world turn to EMCORE. EMCORE's production systems, materials, and processes are the enabling technology behind a variety of advanced electronic and photonic applications.

- **E.R.A.**—One of the largest MOCVD-based development Laboratories in the world, the EMCORE Research and Applications Laboratory provides critical feedback for designing new *TurboDisc* systems, and improving the performance of epitaxial wafers and package-ready devices.
- **TurboDisc**—Manufactures the most reliable high volume Metallorganic Chemical Vapor Deposition (MOCVD) systems in the world, proven to produce epitaxial material with excellent uniformity and reproducibility.
- **E.M.**—Using *TurboDisc* MOCVD production systems, E.M. is the largest manufacturer of epitaxial wafers and provider of wafer foundry services. Wafers are produced on a foundry basis in partnership with specific customers according to the customer's requirements, and under strict confidentiality.
- **Pegasus**—Designs and produces package-ready devices to meet the customer's performance and packaging requirements; and manufactures a full line of InSb sensor products for automotive and non-automotive applications. The devices are fabricated from epitaxial materials created by the E.M. division; and then tested according to specifications worked out in partnership with the customer.
- **MODE**—Designs and manufactures Vertical Cavity Surface Emitting Lasers (VCSELs), which provide enhanced performance benefits to optoelectronic applications such as Internet access, onboard photonics, gigabit Ethernet, DVDs, and fiberoptic switching.
- **EPV**—Manufactures advanced solar cells to accomplish satellite weight reduction by 50%, wing area reduction, improved radiation tolerance, and higher light to power conversion, which increases payload capacity and economic return.

EMCORE Corporation Headquarters  
394 Elizabeth Avenue, Somerset, NJ 08873 USA  
Tel: + 1 (732) 271-9090 • Fax: + 1 (732) 271-9686  
WEB: [www.emcore.com](http://www.emcore.com) • E-mail: [info@emcore.com](mailto:info@emcore.com)



**emcore**

Integrated Compound Semiconductor Solutions

## Conference Chairmen

GIL Bernard - CNRS - Univ. Montpellier, France

MEYER Bruno K. - Univ. Giessen, Germany

MONEMAR Bo - Univ. Linköping, Sweden

## International Advisory Committee

AKASAKI I. - Meijo Univ., Japan

SUK-KI MIN - KIST, Korea

CHUNG C.H. - Yonsei Univ., Korea

MONEMAR B. - Linköping Univ., Sweden

DEN BAARS S. - UCSB, USA

MORKOÇ H. - VCU, Richmond, USA

DMITRIEV V. - Ioffe Inst., Russia

MOUSTAKAS T. - Boston Univ., USA

DUPUIS R. - Univ. Tex. Austin, USA

NAKAMURA S. - Nichia, Japan

EDMOND J. - Cree, Durham, USA

ONABE K. - Tokyo Univ., Japan

FOXON C.T. - Nottingham Univ., UK

PANKOVE J.I. - Univ. Colorado, USA

GARCIA J.C. - Thomson, Orsay, France

PONCE F. - Xerox Parc, USA

GIL B. - CNRS, France

POROWSKI S. - Unipress, Poland

HASEGAWA F. - Tsukuba Univ., Japan

RIECHERT H. - Siemens, Germany

ILEGEMS M. - EPFL, Switzerland

SAKAI S. - Tokushima Univ., Japan

KHAN M.A. - Univ. S. Carolina, USA

SONG J.J. - Oklahoma S. Univ., USA

KISHINO K. - Sophia Univ., Japan

YOSHIDA S. - Saitama Univ., Japan

MEYER B.K. - Giessen, Germany

## Technical Programme Committee

### Chairman

HOFFMANN Axel - TU Berlin, Germany

### Members

BAHIR G. - Technion Haifa, Israel

FIORENTINI V. - Cagliari Univ., Italy

BARANOWSKI J. - Warsaw Univ., Poland

GIBART P. - CNRS, Nice, France

BECHSTEDT F. - Iena Univ., Germany

HOMMEL D. - Bremen Univ., Germany

CALLEJA E. - Madrid Univ., Spain

KAMP M. - Ulm Univ., Germany

CAMASSEL J. - CNRS, Montpellier, France

MASSIES J. - CNRS, Nice, France

CHRISTEN J. - Magdeburg Univ., Germany

O'DONNELL K.P. - Strathclyde Univ., UK

CINGOLANI R. - Lecce Univ., Italy

RENUCCI M. - Toulouse Univ., France

DESCHLER M. - Aachen Univ., Germany

RUTERANA P. - LERMAT, Caen, France

DUGGAN G. - SHARP, Oxford, UK

SCHOLZ F. - Stuttgart Univ., Germany

FEUILLET G. - CEA, Grenoble, France

STUTZMANN M. - Munich Univ., Germany

THERON D. - IEMN, Lille, France

## Steering Committee

### Chairman

LASCARAY Jean-Paul - CNRS - Montpellier Univ., France

### Secretariat

LEFEBVRE Pierre - CNRS - Montpellier Univ., France

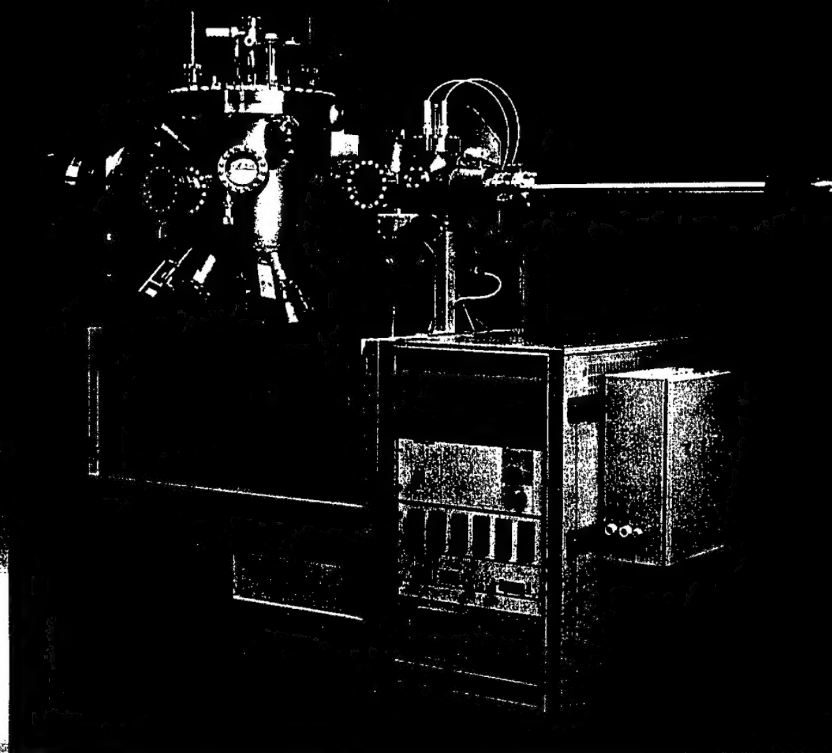
BRETAGNON Thierry - Montpellier Univ., France

### Treasurer

LESTEVEN Isabelle - CNRS - Montpellier Univ., France

**GALLIUM NITRIDE AND RELATED COMPOUNDS  
BLUE LASERS & HIGH POWER ELECTRONICS**

## **RIBER COMPACT 21**



**MODULAR MBE SYSTEM DESIGNED FOR**

# **R I B E R**

*Products and Services for the Compound Semiconductor Industry*

BP N° 231 - 92503 RUEIL-MALMAISON CEDEX - FRANCE

Tel: +33 (0)1 47 08 92 50 - Fax: +33 (0)1 47 08 32 39 - E-mail: [info@riber.com](mailto:info@riber.com) - Website: [www.riber.com](http://www.riber.com)

# GENERAL PROGRAMME

---

## Sunday July 4<sup>th</sup>, 1999

15.00-19.00 REGISTRATION

## Monday July 5<sup>th</sup>, 1999

08.00 Registration  
09.00-09.30 OPENING SESSION - Room : PASTEUR  
09.30-10.30 Conferences  
10.30-11.00 OPENING OF THE EXHIBITION - COFFEE BREAK  
11.00-12.30 Working session  
12.30-14.30 LUNCH BREAK  
14.30-16.45 Working session  
16.45-18.45 POSTER SESSION I - COFFEE BREAK (*offered by EMCORE Corp.*)  
19.00 WELCOMING COCKTAIL - Room : SALON CENTRAL Level 3  
*Offered by Mr. Georges FRECHE, Member of Parliament and Mayor of Montpellier,  
and the local council*

## Tuesday July 6<sup>th</sup>, 1999

08.30-10.30 Working session  
10.30-11.00 VISIT OF THE EXHIBITION - COFFEE BREAK  
11.00-12.30 Working session  
12.30-14.30 LUNCH BREAK  
14.30-16.45 Working session  
16.45-18.45 POSTER SESSION II - COFFEE BREAK (*offered by RIBER S.A.*)  
18.45 Round table

## Wednesday July 7<sup>th</sup>, 1999

08.30-10.45 Working session  
10.45-11.15 VISIT OF THE EXHIBITION - COFFEE BREAK  
11.15-12.30 Special session in honour of Professor AKASAKI  
12.30-14.30 LUNCH BREAK  
14.30-16.45 Working session  
16.45-18.45 POSTER SESSION III - COFFEE BREAK (*offered by EPICHEM LTD.*)  
18.45 CONCERT - Room : PASTEUR

## Thursday July 8<sup>th</sup>, 1999

08.30-10.30 Working session  
10.30-11.00 VISIT OF THE EXHIBITION - COFFEE BREAK  
11.00-12.30 Working session  
12.30-14.30 LUNCH BREAK  
14.30-17.00 Working session  
19.15 Departure by bus for the VALMAGNE ABBEY  
*Meeting place : "Parvis" of the Convention Centre (in front of the level 3 Entrance, side Esplanade)*  
20.00 CONFERENCE BANQUET (*for registered persons*)

## Friday July 9<sup>th</sup>, 1999

08.30-10.30 Working session  
10.30-11.00 VISIT OF THE EXHIBITION - COFFEE BREAK (*offered by AXTRON AG*)  
11.00-12.15 Working session  
12.15 CLOSING SESSION

Accurate • Advanced X-ray Optics • Amorphous • Analysis • Asymmetric Rocking Curves • Automated Specimen Alignment •

Bandgap • **Bede Scientific** • Bond Technique • Bowen-Tanner Method • Bragg-Brentano •

Bulk • Buried Interfaces • Calibration • Ceramics • Characterization • Clean-room Compatible • Compact • Complete Computer Control • Composition •

Compound Semiconductors • Convenient • Crystal Defects • **D1** High Resolution R&D Diffractometer



**D3** Ultra High Resolution R&D Diffractometer • Data Acquisition • Delamination • Density • Depth Profiling •

Detector Scans • Diffraction • Diffuse Scatter • Dislocations • Double Crystal • Easy to Use • Education • Elasticity • Epitaxial Growth • Fab Lines •

Fast • Flexible • Fluorescent • Scatter • Grazing Incidence • High-speed • **High Resolution X-ray**

## Diffractometers For The Compound Semiconductor Industry

Industrial Research • Interpretation • Lattice Parameter • Liquids • Longitudinal Scans • Magnetic Technologies • Manufacturing • Multilayers •

Non-destructive • Orientation • Organics • Parallel Beam X-ray Diffraction • Photoluminescence • Polishing Quality • Polycrystalline • Polymers •

Powder Diffraction • Precipitates • Precision • **QCI<sup>a</sup>** Quality Control X-ray Diffractometer



**QC2<sup>a</sup>** Wafer Mapping Quality Control X-ray Diffractometer • Quality Control • R&D • Rapid •

Reciprocal Space Mapping • Reflectivity • Rocking Curves • Roughness • Safe • Semiconductor • Single Crystal • Slip Bands • Specular Reflectivity •

Stacking Fault Defects • State-Of-The-Art • Stress and Strain Measurements • Surfaces • Symmetric Rocking Curves • Texture • Thickness • Thin Films •

Topography • Transmission • Transverse Scans • Triple Axis • Value For Money • Wafermapping • X-ray Diffraction



**Bede Scientific** Instruments Ltd

Please see us at booth No.12

Bede Scientific Instruments Ltd • Unit 13D • Bowburn South Industrial Estate • Bowburn • Durham • DH6 5AD • UK

Tel: +44 (0) 191 377 2476 • Fax: +44 (0) 191 377 9952 • Email: [info@bede.co.uk](mailto:info@bede.co.uk) • Website: [www.bede.com](http://www.bede.com)

**Monday July 5<sup>th</sup>, 1999**

**Session sponsored by PICO GIGA**

**09:00 OPENING SESSION**

- 09:30 Mo\_01 GALLIUM NITRIDE AS SEEN BY THE INDUSTRY  
Jean Yves Duboz\*
- 10:00 Mo\_02 PRESENT STATUS OF InGaN-BASED LEDs AND LASER DIODES  
Shuji Nakamura\*

**Session sponsored by EMCORE Corp.**

- 11:00 Mo\_03 INFLUENCE OF InGaN INHOMOGENEITY ON NITRIDE LASERS  
K. Domen\*, A. Kuramata, R. Soejima, S. Kubota, K. Horino, T. Tanahashi
- 11:30 Mo\_04 EFFECT OF THE CONFINEMENT LAYER DESIGN ON THE LUMINESCENCE OF  
InGaN/GaN SINGLE QUANTUM WELLS  
S. Keller, S. B. Fleischer, S. F. Chichibu, J. E. Bowers, U. K. Mishra, S. P. DenBaars
- 11:45 Mo\_05 COMPARISON OF InGaN/GaN QUANTUM WELLS GROWN ON SAPPHIRE AND  
BULK GaN SUBSTRATES  
S. Sakai, T. Sugahara, Q. Fareed, S. Tottori, M. Lachab, T. Wang
- 12:00 Mo\_06 INVESTIGATION OF THE OPTICAL PROPERTIES IN InGaN/GaN MULTIPLE QUANTUM WELLS  
AND SINGLE QUANTUM WELL  
T. Wang, D. Nakagawa, M. Lachab, T. Sugahara, S. Sakai
- 12:15 Mo\_07 COMPARISON OF OPTICAL PROPERTIES BETWEEN GaN AND InGaN QUANTUM WELLS  
P. Riblet, H. Hirayama, A. Kinoshita, A. Hirata, T. Sugano, Y. Aoyagi

**Session sponsored by AIXTRON AG**

- 14:30 Mo\_08 PRESSURE STUDIES OF DEFECTS AND IMPURITIES IN NITRIDES  
T. Suski\*
- 15:00 Mo\_09 THE EFFECT OF DOPING AND GROWTH STOICHIOMETRY ON THE PROPERTIES  
OF THREADING EDGE DISLOCATION IN GaN  
A.F. Wright\*, K. Leung
- 15:30 Mo\_10 INVESTIGATIONS ON THE V-DEFECT FORMATION IN GaInN-GaN MULTI QUANTUM  
WELL STRUCTURES  
J. Off, F. Scholz, A. Kniest, O. Gfrörer, A. Hangleiter, G. Brockt, H. Lakner
- 15:45 Mo\_11 STIMULATED EMISSION AND THE MOTT TRANSITION IN GaN EPILAYERS UNDER  
HIGH-DENSITY EXCITATION  
R.A. Taylor, S. Hess, K. Kyhm, J.F. Ryan, G.P. Yablonskii, E.V. Lutsenko,  
V.N. Pavlovskii, M. Heuken
- 16:00 Mo\_12 PHOTOLUMINESCENCE INTENSITY AND SPECTRAL DISTRIBUTION OF GaN FILMS  
ON SiC SUBSTRATES THE DEPENDENCE ON DISLOCATION DENSITY AND STRUCTURE  
P. Hacke, A. Kuramata, K. Domen, T. Tanahashi
- 16:15 Mo\_13 CHARACTERISATION OF GALLIUM NITRIDE DEVICE STRUCTURES USING TRANSMISSION  
ELECTRON MICROSCOPY  
D.M. Tricker, A.N. Bright, C.J. Humphreys
- 16:30 Mo\_14 CATHODOLUMINESCENCE DETERMINATION OF STRAIN-INDUCED SHIFTS AT  
MICROCRACKS IN GaN/AlGaIN MULTI QUANTUM WELLS  
C.E. Norman, R.A. Hogg, A.J. Shields, N. Lizuka

**POSTER SESSION 1**

**Tuesday July 6<sup>th</sup>**

**Session sponsored by CREE Research Inc.**

- 8:30 Tu\_01 ROLE OF POLARIZATION INDUCED EFFECTS IN GROUP III NITRIDE BASED DEVICES  
O. Ambacher\*, L.F. Eastman, M. Stutzmann
- 9:00 Tu\_02 SPONTANEOUS POLARIZATION VERSUS PIEZOELECTRIC FIELD EFFECTS IN III-V NITRIDES  
Fabio Bernardini\*, Vincenzo Fiorentini
- 9:30 Tu\_03 STARK-LIKE LADDER IN PIEZOELECTRIC GaInN/GaN QUANTUM WELLS  
C. Wetzel, T. Takeuchi, H. Amano, I. Akasaki
- 9:45 Tu\_04 DIRECT OBSERVATION OF PYROELECTRIC FIELDS IN InGaN/GaN AND AlGaIn/GaN HETEROSTRUCTURES  
O. Gfrörer, J. Off, F. Scholz, A. Hangleiter
- 10:00 Tu\_05 SCATTERING, RECOMBINATION AND PIEZOELECTRICITY AT DISLOCATIONS IN GROUP III-NITRIDES  
M. Albrecht, S. Christiansen, T. Remmele, H.P. Strunk, A. Cremades, G. Salviati, H. Banzhoff, H. Lichte
- 10:15 Tu\_06 INTRINSIC INFRARED LUMINESCENCE FROM InGaN LAYERS  
K.P. O'Donnell, R.W. Martin, S. Pereira, A. Bangura, M.E. White, W. Van der Stricht, K. Jacobs

**Session sponsored by RIBER S.A.**

- 11:00 Tu\_07 EPITAXIAL GROWTH OF GAN, AlN AND InN: 2D/3D TRANSITION AND SURFACTANT EFFECTS  
B. Daudin\*, G. Feuillet
- 11:30 Tu\_08 MOCVD GROWTH AND OPTICAL CHARACTERIZATION OF STACKED InGaN QUANTUM DOTS FOR LASER APPLICATIONS  
K. Tachibana, T. Someya, Y. Arakawa
- 11:45 Tu\_09 GaN QUANTUM STRUCTURES WITH FRACTIONAL DIMENSIONS - FROM QUANTUM WELL TO QUANTUM DOT  
Satoru Tanaka, Ikuo Suemune, Peter Ramvall, Yoshinobu Aoyagi
- 12:00 Tu\_10 OPTICAL PROPERTIES OF STRUCTURES WITH SINGLE AND MULTIPLE InGaN INSERTIONS IN A GaN MATRIX  
A.V. Sakharov, W.V. Lundin, I.L. Krestnikov, V.A. Semenov, A.S. Usikov, A.F. Tsatsul'nikov, Yu.G. Musikhin, M.V. Baidakova, Zh.I. Alferov, N.N. Ledentsov, A. Hoffmann, D. Bimberg
- 12:15 Tu\_11 In ON GaN SURFACES: ALLOY FORMATION, ORDERING AND SURFACTANT BEHAVIOR  
J. Neugebauer, T. Zywietz, M. Scheffler, J. Northrup

**Session sponsored by Délégation Générale à l'Armement**

- 14:30 Tu\_12 OPTICAL SPECTROSCOPY OF InGaN/GaN QUANTUM WELLS  
E. Berkowicz, D. Gershoni\*, G. Bahir, A.C. Abare, S.P. DenBaars, L.A. Coldren
- 15:00 Tu\_13 MOLECULAR BEAM EPITAXY OF NITRIDE BASED QW STRUCTURES  
N. Grandjean\*, J. Massies
- 15:30 Tu\_14 PROPERTIES OF QUANTUM WELL EXCITONS IN GaN/AlGaIn AND InGaIn/GaN/AlGaIn UV, BLUE, GREEN, AND AMBER LIGHT EMITTING DIODE STRUCTURES  
S.F. Chichibu, T. Deguchi, T. Sota, S.P. DenBaars, S. Nakamura
- 15:45 Tu\_15 DYNAMICS OF EXCITONS IN GaN-AlGaIn MULTIPLE QUANTUM WELLS WITH VARYING DEPTHS, THICKNESSES AND BARRIER LAYERS  
P. Lefebvre, M. Gallart, T. Taliercio, B. Gil, J. Allègre, H. Mathieu, N. Grandjean, M. Leroux, J. Massies, P. Bigenwald
- 16:00 Tu\_16 BAND FILLING AND ENERGY RELAXATION IN InGaIn/GaN-MULTIPLE QUANTUM WELL STRUCTURES  
T. Riemann, D. Rudloff, J. Christen, A. Krost, M. Lünenbürger, H. Protzmann, M. Heuken
- 16:15 Tu\_17 HIGH-RESOLUTION PHOTOLUMINESCENCE AND REFLECTANCE SPECTRA OF HOMOEPITAXIAL GaN-LAYERS  
K. Kornitzer, T. Ebner, M. Grehl, K. Thonke, R. Sauer, C. Kirchner, V. Schwegler, M. Kamp, M. Leszczynski, I. Grzegory, S. Porowski
- 16:30 Tu\_18 TEMPORARY DYNAMICS OF EXCITON-POLARITONS IN GaN FILMS  
G. Malpuech, A.V. Kavokin

**POSTER SESSION 2**

- 18:45 Round table - sponsored by EMCORE Corp.

## Thursday July 8<sup>th</sup>

### Session sponsored by CNRS

- 8:30 Th\_01 ANOMALOUS BEHAVIOR OF NITRIDE ALLOYS  
**A. Zunger\***
- 9:00 Th\_02 LATTICE DYNAMICS OF TERNARY ALLOYS  
**Friedhelm Bechstedt\***
- 9:30 Th\_03 ENERGY BAND/LATTICE MISMATCH ENGINEERING IN QUATERNARY AlInGa<sub>N</sub>/Ga<sub>N</sub> HETEROSTRUCTURE  
**M. Asif Khan, J.W. Yang, G. Simin, Hans zur Loye, R. Bicknell-Tassius, R. Gaska, M.S. Shur, G. Tamulaitis, A. Zukauskas**
- 9:45 Th\_04 MOVPE GROWTH AND LUMINESCENCE PROPERTY OF GaAsN ALLOYS WITH HIGHER NITROGEN CONCENTRATIONS  
**K. Onabe, D. Aoki, J. Wu, H. Yaguchi, Y. Shiraki**
- 10:00 Th\_05 MECHANISM FOR LIGHT EMISSION IN GaNAs/GaAs STRUCTURES GROWN BY MOLECULAR BEAM EPITAXY  
**I.A. Buyanova, W.M. Chen, P.N. Hai, B. Monemar, H. Xin, C. W. Tu**
- 10:15 Th\_06 MOVPE GROWTH OF In-RICH In<sub>x</sub>Ga<sub>1-x</sub>N (0.5 ≤ x ≤ 1) FILMS ON α-Al<sub>2</sub>O<sub>3</sub>(0001)  
**A. Yamamoto, Y. Nakagawa, T. Sugiura, A. Hashimoto**

### Session sponsored by University Montpellier II

- 11:00 Th\_07 CONDUCTION BAND ENERGY SPECTRUM OF TWO DIMENSIONAL ELECTRONS IN GaN/AlGa<sub>N</sub> HETEROJUNCTIONS  
**W. Knap\*, E. Frayssinet, C. Skierbiszewski, C. Chaubet, M.L. Sadowskia, D. Maude, M. Asif Khan, M.S. Shur**
- 11:30 Th\_08 RECORD HIGH MOBILITY AlGa<sub>N</sub>/Ga<sub>N</sub> HETEROSTRUCTURES BASED ON OPTIMIZATION OF Ga<sub>N</sub> BY MBE  
**B. Heying, C. Elsass, I. Smorchkova, T. Mates, E. Haus, P. Fini, S.P. DenBaars, U. Mishra, J.S. Speck**
- 11:45 Th\_09 GROWTH OF HIGH MOBILITY AlGa<sub>N</sub>/Ga<sub>N</sub> HETEROSTRUCTURES BY AMMONIA-MOLECULAR BEAM EPITAXY  
**James B. Webb, H. Tang, J. Bardwell**
- 12:00 Th\_10 ENHANCED TWO-DIMENSIONAL ELECTRON GAS CONFINEMENT EFFECT ON TRANSPORT PROPERTIES IN AlGa<sub>N</sub>/InGa<sub>N</sub>/AlGa<sub>N</sub> DOUBLE-HETEROSTRUCTURES  
**N. Maeda, T. Saitoh, K. Tsubaki, T. Nishida, N. Kobayashi**
- 12:15 Th\_11 WURTZITE Ga<sub>N</sub> SURFACE RECONSTRUCTIONS STUDIED BY STM  
**T. Sakurai, Q.K. Xue, Q.Z. Xue, Y. Hasegawa, I.S.T. Tsong, T. Ohno**

### Session sponsored by RENISHAW Ltd.

- 14:30 Th\_12 GROWTH AND CHARACTERIZATION OF HIGH-EFFICIENCY InGa<sub>N</sub> MQW BLUE AND GREEN LEDS FROM LARGE-SCALE PRODUCTION MOCVD REACTORS  
**C.A. Tran\*, R.F. Karlicek Jr., M.G. Brown, I. Eliashevich, A. Whitcomb, A. Gurary, R. Saito**
- 15:00 Th\_13 MULTIWAFFER PLANETARY REACTORS FOR THE PRODUCTION OF Ga<sub>N</sub> BASED COMPOUNDS  
**M. Heuken\***
- 15:30 Th\_14 HETEROEPITAXY OF DOPED AND UNDOPED CUBIC III-NITRIDES  
**D.J. As\*, K.Lischka**
- 16:00 Th\_15 MICROSTRUCTURE OF CUBIC AND HEXAGONAL Ga<sub>N</sub> GROWN ON SAPPHIRE (0001) BY ECR-MBE WITH VARIOUS ELECTRIC BIASES  
**T. Araki, T. Minami, Y. Nanishi**
- 16:15 Th\_16 THE INFLUENCE OF STRUCTURAL PROPERTIES ON THE MECHANISMS OF OPTICAL AMPLIFICATION IN CUBIC InGa<sub>N</sub>  
**J.Chr. Holst, A. Hoffmann, I. Broser, F. Bertram, T. Riemann, J. Christen, D.J. As, D. Schikora, B. Schoettker, K. Lischka**
- 16:30 Th\_17 COMPREHENSIVE INVESTIGATION ON THE MIXING AND REACTING BEHAVIORS OF PRECURSORS DURING METAL ORGANIC VAPOR PHASE EPITAXY OF GALLIUM NITRIDE  
**T.F. Kuech, Jingxi Sun, K.S. Boutros, J.M. Redwing**
- 16:45 Th\_18 GROWTH OF HIGH QUALITY Ga-POLAR Ga<sub>N</sub> LAYERS ON Ga<sub>N</sub> SUBSTRATES AFTER NOVEL REACTIVE ION ETCHING  
**J.L. Weyhe, A. Zauner, P.D. Brown, F. Karouta, A. Wysmolek, P.R. Hageman, S. Porowski**

Wednesday July 7<sup>th</sup>

**Session sponsored by NICHIA Chemical Industries**

- 8:30 We\_01 STATUS OF NITRIDE BASED EMITTERS ON SiC.  
K. Doverspike, H. Dieringer, D. Emerson, K. Habereran, D. Slater, H.S. Kong, G.E. Bulman, J. Edmond
- 9:00 We\_02 CW OPERATION OF AlGaInN-GaN LASER DIODES  
T. Asano, K. Yanashima, T. Asatsuma, T. Hino, T. Yamaguchi, S. Tomiya, T. Kobayashi, M. Ikeda
- 9:30 We\_03 FABRICATION AND CHARACTERIZATION OF GaN-BASED LASER DIODE GROWN ON THICK N-AlGaIn CONTACT LAYER  
T. Takeuchi, T. Detchprohm, M. Yano, M. Yamaguchi, N. Hayashi, M. Iwaya, K. Isomura, K. Kimura, H. Amano, I. Akasaki, Yw. Kaneko, S. Watanabe, Y. Yamaoka, R. Shioda, T. Hidaka, Ys. Kaneko, N. Yamada
- 9:45 We\_04 CONTINUOUS-WAVE OPERATION OF INGAN MULTI-QUANTUM-WELL LASER DIODES GROWN ON AN N-GAN SUBSTRATE WITH A BACKSIDE N-CONTACT  
M. Kuramoto, C. Sasaoka, Y. Hisanaga, A. Kimura, A.A. Yamaguchi, H. Sunakawa, N. Kuroda, M. Nido, A. Usui, M. Mizuta
- 10:00 We\_05 RECOMBINATION DYNAMICS IN In<sub>x</sub>Ga<sub>1-x</sub>N MULTIPLE-QUANTUM-WELL BASED LASER DIODES UNDER HIGH PHOTO-EXCITATION  
Yukio Narukawa, Yoichi Kawakami, Shigeo Fujita, Shuji Nakamura
- 10:15 We\_06 346 nm EMISSION FROM AlGaIn MULTI-QUANTUM-WELL LIGHT EMITTING DIODE  
T. Nishida, N. Kobayashi
- 10:30 We\_14 ROOM-TEMPERATURE CONTINUOUS-WAVE OPERATION OF INGAN MULTIPLE QUANTUM WELL LASER DIODES WITH AN ASYMMETRIC WAVEGUIDE STRUCTURE  
Michael Kneissl, David P. Bour, Chris G. Van de Walle, Linda T. Romano, John E. Northrup, Rose M. Wood, Mark Teepe, Noble M. Johnson
- 11:15 **SPECIAL SESSION IN HONOUR OF PROFESSOR AKASAKI**

**Session sponsored by Thomas Swan & Co. Ltd.**

- 14:30 We\_07 MOCVD GROWTH OF GROUP-III NITRIDE BASED HETEROSTRUCTURES FOR HIGH POWER, HIGH FREQUENCY ELECTRONICS  
S. Den Baars, U. Mishra, C. Chen, G. Parish, S. Keller, Y.F. Wu, D. Kapolnek, B. Keller
- 15:00 We\_08 RESULTS, POTENTIAL AND CHALLENGES OF HIGH POWER GAN-BASED TRANSISTORS  
Lester F. Eastman
- 15:30 We\_09 FIRST DEMONSTRATION OF AlGaIn/GaN DUAL-GATE MODULATION-DOPED FIELD-EFFECT TRANSISTORS  
C.H. Chen, K. Krishnamurthy, Y.F. Wu, S. Keller, G. Parish, M. Rodwell, Steven P. Denbaars, U.K. Mishra
- 15:45 We\_10 DC AND RF CHARACTERIZATION OF AlN/GaN HFETs  
I. Daumiller, P. Schmid, C. Kirchner, M. Kamp, L. Pond, K.J. Ebeling, C. Weitzel, E. Kohn
- 16:00 We\_11 AlGaIn/GaN HFETs WITH NEW OHMIC AND SCHOTTKY CONTACTS FOR THERMAL STABILITY UP TO 400°C  
J. Hilsenbeck, W. Rieger, E. Nebauer, G. Tränkle, J. Würfl, A. Ramakrishnan, H. Obloh
- 16:15 We\_12 SCHOTTKY BARRIER PHOTODETECTOR ON EPITAXIAL LATERAL OVERGROWN GaN  
E. Monroy, F. Calle, E. Muñoz, B. Beaumont, F. Omnès, P. Gibart
- 16:30 We\_13 REDUCTION OF OHMIC CONTACT RESISTIVITY ON P-TYPE GAN BY SURFACE TREATMENT  
J.L. Lee, J.K. Kim, J.W. Lee, Y.J. Park, T. Kim

**POSTER SESSION 3**

18:45 **CONCERT**

**Friday July 9<sup>th</sup>**

**Session sponsored by Thomson-CSF**

- 8:30 Fr\_01 RECENT PROGRESS IN SELECTIVE AREA GROWTH AND EPITAXIAL LATERAL OVERGROWTH OF III-NITRIDES  
K. Hiramatsu\*, H. Miyake, A. Motogaito, H. Sone, Y. Kawaguchi, N. Sawaki, Y. Lyeckika, T. Maeda
- 9:15 Fr\_02 PENDEO-EPITAXY VS. LATERAL EPITAXIAL OVERGROWTH OF GaN - A COMPARATIVE STUDY  
Tsuetanka S. Zheleva, Wael M. Ashmawi, Kenneth A. Jones, Darren Thomson, Thomas Gehrke, Kevin Linthicum, Robert F. Davis
- 9:30 Fr\_03 SELECTIVE AREA GROWTH OF GaN ON STRIPE-PATTERNED (111) Si SUBSTRATE BY METALORGANIC VAPOR PHASE EPITAXY  
Y. Kawaguchi, Y. Honda, M. Yamaguchi, N. Sawaki, K. Hiramatsu
- 9:45 Fr\_04 TEM STUDY OF THE BEHAVIOUR OF DISLOCATIONS DURING ELOG GaN GROWTH  
V. Bousquet, P. Vennéguès, B. Beaumont, P. Gibart
- 10:00 Fr\_05 SELECTIVE GROWTH OF CUBIC GaN ON PATTERNED GaAs (100) SUBSTRATES BY METALORGANIC VAPOR PHASE EPITAXY  
Jun Wu, Masahiro Kudo, Akira Nagayama, Ryuji Katayama, Hiroyuki Yaguchi, Kentaro Onabe, Yasuhiro Shiraki
- 10:15 Fr\_06 STRUCTURAL, OPTICAL, AND ELECTRICAL PROPERTIES OF GaN LATERALLY OVERGROWN ON Si(111) SUBSTRATES FOR DEVICE APPLICATIONS  
H. Marchand, N. Zhang, J.P. Ibbetson, L. Zhao, B. Moran, Y. Golan, S.J. Rosner, G. Girolami, P.T. Fini, S. Keller, J.S. Speck, S.P. DenBaars, U.K. Mishra

**Session sponsored by European Research Office - US Army**

- 11:00 Fr\_07 DEFECT AND STRESS CONTROL IN GROUP III NITRIDES USING LOW TEMPERATURE INTERLAYERS  
H. Amano\*, M. Iwaya, N. Hayashi, T. Kashima, T. Takeuchi, C. Wetzel, I. Akasaki, J. Han, S. Hearne, J.A. Floro, E. Chason, J. Figiel
- 11:30 Fr\_08 GaN/SiC QUASI-SUBSTRATES FOR GaN-BASED LEDs  
C. Kirchner, V. Schwegler, M. Kamp, K.J. Ebeling, Yu. Melnik, A. Nikolaev, D. Tsvetkov, V. Dmitriev
- 11:45 Fr\_09 GaN SUBSTRATES: GROWTH and CHARACTERIZATION  
Olga Kryliouk, Michael Reed, Michael Mastro, Timothy Anderson, Bruce Chai
- 12:00 Fr\_10 GaN ON Si(111): FROM GROWTH OPTIMIZATION TO OPTICAL PROPERTIES OF QUANTUM WELL STRUCTURES  
F. Semond, B. Damilano, S. Vézian, N. Grandjean, M. Leroux, J. Massies
- 12:15 **CLOSING SESSION**

# Did you know Thomas Swan...

have specifically designed a  
close-coupled showerhead  
(CCS) MOCVD reactor for GaN

## Did you know CCS...

- maximises reagent utilisation
- enables excellent uniformity of thickness and alloy composition
- delivers monolayer abruptness of interfaces
- enables high Indium and Aluminium content alloys
- delivers on process stability and reproducibility
- enables high linear rates of growth  $< 8 \mu\text{m/hr}$
- minimises and improves reactor efficiency



CCS is available  
at 1x2", 3x2"  
and 6x2" for GaN

CCS The MOCVD  
technology of  
choice for GaN



Thomas Swan & Co. Ltd.

Unit 1c, Button End, Harston,

Cambridge, CB2 5NX UK

Tel: +44 (0)1223 872282 Fax: +44 (0)1223 871714

E-mail: [sales@thomasswan.co.uk](mailto:sales@thomasswan.co.uk)

## POSTER SESSION 1

**Monday July 5<sup>th</sup>**

- Mo\_P001** THE GaN GROWTH BY A HOT FILAMENT METALORGANIC VAPOR PHASE DEPOSITION TECHNIQUE  
T. Boufaden, A. Rebey, I. Halidou, Z. Chine, B. El Jani
- Mo\_P002** NEW PRETREATMENT OF SAPPHIRE FOR GaN DEPOSITION  
Dongjin Byun, Hyun-Jeong Kim, Chang Hee Hong, Gyeungho Kim, Dong-Wha Kum
- Mo\_P003** MULTIPARAMETER STATISTICAL DESIGN OF EXPERIMENTS FOR GaN GROWTH OPTIMIZATION  
A. Hass Bar-Ilan, S. Zamir, O. Katz, B. Meyler, J. Salzman
- Mo\_P004** THICK HYDRIDE VAPOUR PHASE EPITAXIAL GaN LAYERS GROWN ON A-PLANE SAPPHIRE WITH DIFFERENT BUFFERS  
T. Paskova, E. Goldys, J. Birch, E.B. Svedberg, P. Runesson, S. Tungasmita, B. Monemar
- Mo\_P005** MOCVD GROWTH OF CUBIC GALLIUM NITRIDE : THE EFFECT OF THE V/III RATIO  
M. Moret, S. Ruffenach-Clur, N. Moreaud, O. Briot, J. Calas, R.L. Aulombard
- Mo\_P006** RHEED STUDIES OF GROUP III NITRIDES GROWN BY MBE  
C.T. Foxon, C.S. Davis, S.V. Novikov, O.H. Hughes
- Mo\_P007** THICK GaN GROWTH ON GaAs (111) SUBSTRATES AT 1000°C WITH HVPE  
F. Hasegawa, M. Minami, K. Sunaba, T. Suemasu
- Mo\_P008** EXPERIMENTAL AND THEORETICAL STUDY OF THE GROWTH OF GaN ON SAPPHIRE BY HVPE  
A. Trassoudaine, E. Aujol, P. Disseix, D. Castelluci, R. Cadoret
- Mo\_P009** GROWTH CONTROL OF CUBIC GaN AND CUBIC GaInN (GaAlN) ALLOYS BY RHEED OSCILLATIONS  
E. Martinez-Guerrero, B. Daudin, G. Feuillet, H. Mariette, P. Aboughe-nze, Y. Monteil, A. Philippe, C. Bru-Chevallier
- Mo\_P010** GROWTH AND CHARACTERISATION OF GALLIUM NITRIDE FILMS PRODUCED BY LOW TEMPERATURE REACTIVE SPUTTERING  
W.T. Young, S.R.P. Silva, M. Kuball, J.V. Anguita, J.M. Shannon, K.P. Homewood, B.J. Sealy
- Mo\_P011** QUANTUM CHEMICAL STUDIES OF GAS PHASE REACTIONS BETWEEN TMA, TMG, TMI AND NH<sub>3</sub>  
A. Tachibana, K. Nakamura, O. Makino, H. Tokunaga, N. Akutsu, K. Matsumoto
- Mo\_P012** MBE GROWTH OF HEXAGONAL InN FILMS ON SAPPHIRE WITH DIFFERENT INITIAL GROWTH STAGES  
V.V. Mamutin, V.A. Vekshin, V.Yu. Davydov, V.V. Ratnikov, T.V. Shubina, V.V. Emtsev, S.V. Ivanov, P.S. Kop'ev
- Mo\_P013** Mg-DOPED HEXAGONAL InN/Al<sub>2</sub>O<sub>3</sub> FILMS GROWN BY MBE  
V.V. Mamutin, V.A. Vekshin, V.Yu. Davydov, V.V. Ratnikov, Yu. Kudriavtsev, B.Ya. Ber, V.V. Emtsev, S.V. Ivanov
- Mo\_P014** GROWTH AND OPTICAL CHARACTERIZATION OF ALUMINUM NITRIDE ALLOYS WITH HIGH ALUMINUM-CONTENTS  
J. Y. Lin, R. Mair, J. Li, H.S. Kim, H.X. Jiang
- Mo\_P015** 2.6µm/hr HIGH-SPEED GROWTH OF GaN BY RF-MOLECULAR BEAM EPITAXY AND IMPROVEMENT OF CRYSTAL QUALITY BY MIGRATION ENHANCED EPITAXY  
Daisuke Sugihara, Akihiko Kikuchi, Kazuhide Kusakabe, Shinichi Nakamura, Yousuke Toyoura, Takayuki Yamada, Katsumi Kishino
- Mo\_P016** EPITAXIAL GROWTH OF GaN, AlN AND ZnO THIN FILMS ON SAPPHIRE SUBSTRATE BY SINGLE TARGET OFF-AXIS SPUTTERING  
S.W. Kim, N. Kamata, S. Hino, T. Kodama, H. Hirose, T. Yamada\*, T. Suzuki
- Mo\_P017** LOW-TEMPERATURE SYNTHESIS OF GALLIUM NITRIDE THIN FILMS USING REACTIVE RF-MAGNETRON SPUTTERING  
V. Bondar, I. Kucharsky, B. Simkiv, Yu. Dubov, S. Popovich
- Mo\_P018** PREFERENTIAL GROWTH MODE OF CUBIC GaN BY METALORGANIC MOLECULAR BEAM EPITAXY ON SAPPHIRE (0001) SUBSTRATES  
J. Suda, T. Kurobe, T. Masuda, H. Matsunami
- Mo\_P019** GROWTH AND CHARACTERIZATION OF THICK AlGaIn EPILAYERS DOPED WITH Si GROWN ON SAPPHIRE SUBSTRATES  
W.V. Lundin, A.S. Usikov, A.V. Sakharov, V.V. Tretyakov, D.V. Poloskin
- Mo\_P020** INFLUENCE OF AMBIENT GAS ON THE EPITAXIAL LATERAL OVERGROWTH OF GaN BY METALORGANIC VAPOR PHASE EPITAXY  
Y. Kawaguchi, S. Nambu, M. Yamaguchi, N. Sawaki, H. Miyake, K. Hiramatsu, K. Tsukamoto, N. Kuwano, K. Oki

<b>Mo_P021</b>	MOVPE GROWTH OF HIGH QUALITY CUBIC GaN ON GaAs - THE ROLE OF GROWTH RATES AND BUFFER LAYER STRUCTURES <b>M. Funato, M. Ogawa, T. Ishido, Sz. Fujita, Sg. Fujita</b>
<b>Mo_P022</b>	MBE GROWTH OF AUTODOPED GaN USING A THIN AlN INTERMEDIATE LAYER <b>J. Stemmer, H. Klausning, D. Mistele, T. Rotter, O. Semchinova, J. Aderhold, J. Graul</b>
<b>Mo_P023</b>	EPITAXY OF GALLIUM NITRIDE BY HVPE USING LOW TEMPERATURE INTERMEDIATE BUFFER LAYERS DEPOSITED BY MOCVD <b>V. Wagner, O. Parillaud, H.J. Bühlmann, M. Illegems</b>
<b>Mo_P024</b>	IN SITU MONITORING OF GAN GROWTH IN MULTIWAFFER MOVPE REACTORS <b>M. Heuken, H. Protzmann, M. Luenenbuerger, H. Juergensen</b>
<b>Mo_P025</b>	Mg-INDUCED KINETICAL CHANGES IN THE GROWTH OF CUBIC AND HEXAGONAL GaN BY MOLECULAR BEAM EPITAXY <b>Guido Mula, Bruno Daudin, Philippe Peyla</b>
<b>Mo_P026</b>	SUBLIMATION GROWTH OF AlN <b>S.Yu. Karpov, D.V. Zimina1, Yu.N. Makarov, E.N. Mokhov, A.D. Roenkov, M.G. Ramm, Yu.A. Vodakov</b>
<b>Mo_P027</b>	MODELING STUDY OF HYDRIDE VAPOR PHASE EPITAXY OF GaN <b>S.Yu. Karpov, D.V. Zimina, Yu.N. Makarov, B. Beaumont, J. Nataf, P. Gibart, M. Heuken, H. Juergensen, A. Krishnan</b>
<b>Mo_P028</b>	MOCVD EPITAXY ON FREE-STANDING HVPE-GaN SUBSTRATES <b>R. Miskys, M.K. Kelly, O. Ambacher, M. Stutzmann</b>
<b>Mo_P029</b>	INTERFACE TREATMENT OF GaN/InGaN-MULTI QUANTUM WELL STRUCTURES GROWN IN PRODUCTION TYPE MOVPE SYSTEMS <b>M. Heuken, M. Luenenbuerger, J. Blaesing, A. Krost, H. Protzmann</b>
<b>Mo_P030</b>	ON THE ORIGINS OF LOW INDIUM INCORPORATION DURING MOVPE OF InGaN <b>Yu.N. Makarov, R.A. Talalaev, E.V. Yakovlev, S.Yu. Karpov, I.Yu. Evstratov, A.N. Vorob'ev</b>
<b>Mo_P031</b>	GROWTH AND EVAPORATION KINETICS OF GaN IN AMMONIA ATMOSPHERE <b>S.Yu. Karpov, R.A. Talalaev, Yu.N. Makarov, N. Grandjean, J. Massies</b>
<b>Mo_P032</b>	MECHANISM OF CHEMICAL VAPOUR DEPOSITION OF GALLIUM NITRIDE FILMS BASED ON PYROLYSIS OF AMMONIA HALIDES COMPLEXES <b>S.E. Alexandrov, D.M. Krasovitskiy</b>
<b>Mo_P033</b>	INFLUENCE OF THE GaN SEED LAYER AND GROWTH PARAMETERS ON SELECTIVE EPITAXY OF GaN BY HVPE <b>O. Parillaud, V. Wagner, H.J. Bühlmann, M. Illegems</b>
<b>Mo_P034</b>	A TWO STEP METHOD FOR EPITAXIAL LATERAL OVERGROWTH OF GaN <b>B. Beaumont, V. Bousquet, P. Vennéguès, M. Vaille, A. Bouillé, P. Gibart, S. Dassonneville, A. Amokrane, B. Sieber</b>
<b>Mo_P035</b>	REMOTE PLASMA MOCVD GROWTH AND PROCESSING OF GaN BY REAL TIME ELLIPSOMETRY <b>M. Losurdo, P. Capezzuto, G. Bruno</b>
<b>Mo_P036</b>	PROPERTIES OF HOMOEPITAXIAL AND HETEROEPITAXIAL GaN LAYERS GROWN BY PLASMA-ASSISTED MBE <b>M.A. Sánchez-García, F.B. Naranjo, J.L. Pau, A. Jiménez, E. Calleja, E. Munoz, S.I. Molina, A.M. Sánchez, F.J. Pacheco, R. García</b>
<b>Mo_P037</b>	SURFACTANT EFFECT OF As ON THE GROWTH OF GaN ON Si(111) SUBSTRATES BY PLASMA ASSISTED MBE <b>A. Jiménez, M.A. Sánchez-García, F.B. Naranjo, J.L. Pau, E. Calleja, E. Munoz, S.I. Molina, A.M. Sánchez, F.J. Pacheco, R. García</b>
<b>Mo_P038</b>	GROWTH OF AlGaIn ON Si(111), Al <sub>2</sub> O <sub>3</sub> (0001) AND GaN(0001) BY PLASMA-ASSISTED MBE <b>F.B. Naranjo, J.L. Pau, A. Jiménez, M.A. Sanchez-García, E. Calleja, E. Muñoz</b>
<b>Mo_P039</b>	STRUCTURE OF AlN AND GaN BULK CRYSTAL GROWN BY HVPE <b>M. Albrecht, H.P. Strunk, Yu. Melnik, A. Nikolaev, I. Nikitina, V. Dmitriev, F. Demangeot, J. Frandon, M. Renucci</b>
<b>Mo_P040</b>	SUPPRESSION OF THE HEXAGONAL PHASE IN CUBIC GaN FILMS BY USING MISORIENTED GaAs (001) SUBSTRATES <b>A. Nagayama, R. Katayama, N. Nakadan, K. Miwa, H. Yaguchi, J. Wu, K. Onabe, Y. Shiraki</b>
<b>Mo_P041</b>	STRAIN RELAXATION IN GAN FILMS AS A FUNCTION OF GROWTH DIRECTION AND BUFFER LAYER MEASURED BY RAMAN SPECTROSCOPY <b>R. Seitz, T. Monteiro, E. Pereira, M. Di Poisson-Forte</b>
<b>Mo_P042</b>	GROWTH OF POLYCRYSTALLINE GaN ON SILICON(001) SUBSTRATES BY RF PLASMA CHEMICAL VAPOR DEPOSITION WITH ZnO BUFFER LAYER <b>D.C. Park, Sz. Fujita, Sg. Fujita</b>
<b>Mo_P043</b>	THE APPLICATION OF LOW TEMPERATURE GaN BUFFER LAYER ON ZnO/Si SUBSTRATE TO OBTAIN THICK FILMS OF HIGH QUALITY GaN <b>J.W. Lee, S.W. Park, H.S. Paek, J.B. Yoo, P.W. Yu</b>

- Mo\_P044** GROWTH OF BULK AlN BY PHYSICAL VAPOR TRANSPORT  
Tim Housain, V. Dmitriev, P. Zhou, H.N. Jayathirtha, M.G. Spencer, V. Dimitriev, Yu Melnik, A. Nikolaev
- Mo\_P045** LOW TEMPERATURE GROWTH OF GaN ON  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> AND Si SUBSTRATE USING AN ATOMIC NITROGEN SOURCE BASED ON DIELECTRIC BARRIER DISCHARGE  
Dongjin Byun, Joosung Kim, Jin-Sang Kim, Dong-Wha Kum
- Mo\_P046** MOCVD GROWTH OF GaN ON LiAlO<sub>2</sub> (100) SUBSTRATES  
Ke Xu, Peizhen Deng, Zujie Fang, Jun Xu
- Mo\_P047** MIXING MECHANISM OF h-GaN IN c-GaN GROWTH ON GaAs (001) SUBSTRATES  
A. Hashimoto, H. Wada, T. Ueda, A. Masuda, A. Yamamoto
- Mo\_P048** GROWTH OF BORON NITRIDE THIN FILMS ON SILICON SUBSTRATES USING NEW ORGANOBORON PRECURSORS  
Jin-Hyo Boo, Carsten Rohr, Wilson Ho
- Mo\_P049** GROWTH OF AlN AND GaN THIN FILMS ON Si(100) USING NEW SINGLE MOLECULAR PRECURSORS BY MOCVD METHOD  
J.H. Boo, S.B. Lee, Y.S. Kim, J.T. Park, K.S. Yu, Y. Kim
- Mo\_P050** CHARACTERISTICS OF OPTICALLY-PUMPED FREE STANDING GaN GROWN BY HYDRIDE VAPOR PHASE EPITAXY  
S.T. Kim, K.Y. Park, M.H. Lee, D.C. Moon, J.K. Kim, Y.H. Choi, T.K. Yoo
- Mo\_P051** INFLUENCE OF GROWTH CONDITION ON QUALITY OF GaN, AlN AND AlGaIn GROWN ON SiC AND SAPPHIRE BY RF-PLASMA ASSISTED MOLECULAR BEAM EPITAXY  
Ming Qi, Alzhen Li, Wei Li, Zhibiao Zhao, Yonggang Zhang
- Mo\_P052** PHOTOLUMINESCENCE AND GAIN OF MBE GROWN CUBIC In<sub>x</sub>Ga<sub>1-x</sub>N/GaN HETEROSTRUCTURES  
T. Frey, D.J. As, D. Schikora, K. Lischka, J. Holst, A. Hoffmann
- Mo\_P053** A COMPARATIVE STUDY OF MOVPE GROWTH OF InN ON GaAs(111) SUBSTRATES USING A NITRIDED OR GROWN GaN BUFFER LAYER  
A. Yamamoto, T. Arita, M. Adachi, T. Sugiura, A. Hashimoto
- Mo\_P054** EFFECT OF HYDROGEN ON GROWTH BEHAVIOR OF GaN DURING REMOTE PLASMA ENHANCED METALORGANIC CHEMICAL VAPOR DEPOSITION  
M.H. Kim, H.J. Kim, H. Na, F. Qi, E. Yoon
- Mo\_P055** CLASSICAL AND QUANTUM SIMULATIONS OF In AND Al INCORPORATION IN GaN  
J.A. Chisholm, P. D. Bristowe
- Mo\_P056** HIGH-QUALITY GaN ON Si SUBSTRATE BY USE OF AlGaIn/GaN INTERMEDIATE LAYER  
H. Ishikawa, Z.Y. Zhao, N. Nakada, T. Egawa, T. Soga, T. Jimbo, M. Umeno
- Mo\_P057** GAS PHASE STUDIES OF TRIMETHYLGALLIUM WITH AMMONIA, PROPYLAMINE AND WATER AT ELEVATED TEMPERATURES: TOWARDS AN UNDERSTANDING OF GaN GROWTH AND OXYGEN INCORPORATION  
U. Bergmann, V. Reimer, B. Atakan
- Mo\_P058** HOMOEPITAXIAL GROWTH AND LUMINESCENCE CHARACTERIZATION OF GaN EPILAYER BY RF-MBE ON MOCVD-GROWN GaN SUBSTRATE  
S. Kurai, S. Kubo, T. Okazaki, S. Manabe, T. Sugita, A. Kawabe, Y. Yamada, T. Taguchi
- Mo\_P059** INFLUENCE OF THE GROWTH CONDITIONS ON THE SURFACE MORPHOLOGY AND STRUCTURE OF MBE GROWN AlN  
L. Kirste, M. Rattunde, J. Portmann, R. Brenn, K.W. Benz, D.G. Ebling, K. Tillmann
- Mo\_P060** INFLUENCE OF MBE GROWTH TEMPERATURE ON THE PROPERTIES OF CUBIC GaN GROWN DIRECTLY ON GaAs SUBSTRATES  
A. Georgakilas, M. Androulidaki, K. Tsagaraki, K. Amimer, G. Constantinidis, N.T. Pelekanos
- Mo\_P061** POSSIBILITY OF STRAIN CONTROL IN AlN LAYER GROWN BY MOVPE ON (0001)6H-SiC WITH GaN/AlN BUFFER  
H. Kawanishi, M. Kurimoto, T. Nakada, Y. Ishihara, M. Shibata, T. Takano, J. Yamamoto, T. Honda
- Mo\_P062** CHARACTERIZATION OF AlGaIn/GaN HETEROSTRUCTURES GROWN BY METALORGANIC CHEMICAL VAPOR DEPOSITION  
R.D. Dupuis, C.J. Eiting, D.J.H. Lambert, H.K. Kwon, B.S. Shelton, M.M. Wong, T.G. Zhu, D.E. Lin
- Mo\_P063** X-RAY PHOTOELECTRON SPECTROSCOPIC INVESTIGATION OF THE GaAs NITRILATION MECHANISM WITH AN ECR PLASMA SOURCE  
M. Sauvage-Simkin, Y. Garreau, A. Barski, R. Langer, F. Bruno, L. Floreano, R. Gotter, A. Morgante, A. Santaniello, D. Svetko, A. Verdini
- Mo\_P064** OPTIMIZATION OF Si/N TREATMENT TIME OF SAPPHIRE SURFACE AND ITS EFFECT ON THE MOVPE GaN OVERLAYERS  
S. Haffouz, B. Beaumont, P. Vennéguès, P. Gibart
- Mo\_P065** PLASMA-ASSISTED MBE GROWTH OF GaN ON HVPE-GaN AND SAPPHIRE SUBSTRATES  
A. Rinta-Möykky, P. Laukkanen, S. Lehtonen, S. Laaksonen, J. Likonen, P. Uusimaa, M. Pessa

- Mo\_P066** PROCESS OPTIMISATION OF THE REACTIVE ION ETCHING OF GALLIUM NITRIDE IN METHYLCHLORIDE/HYDROGEN USING THE ORTHOGONAL DESIGN METHOD  
**M. Dineen, H. Thomas, B. Humphreys, S.G. McMeekin**
- Mo\_P067** STUDIES OF GaN HOMOEPITAXY WITH LOW-ENERGY ELECTRON MICROSCOPY  
**I.S.T. Tsong, A. Pavlovska, V.M. Torres, E. Bauer, R.B. Doak, D.B. Thomson, R.F. Davis**
- Mo\_P068** RAMAN SCATTERING STUDY OF ZINC BLENDE  $\text{In}_x\text{Ga}_{1-x}\text{N}$  ALLOYS  
**A. Tabata, E. Silveira, J.R. Leite, A.P. Lima, L.M.R. Scolfaro, V. Lemos, T. Frey, D.J. As, D. Schikora, K. Lischka**
- Mo\_P069** EFFECT OF ANNEALING ON DEFECTS IN AS-GROWN AND  $\gamma$ -RAY IRRADIATED n-GaN LAYERS  
**N. Shmidt, V. Emtsev, I. Krestnikov, W. Lundin, A. Osinsky, D. Poloskin, A. Sakharov, A. Usikov**
- Mo\_P070** PHASE SEPARATION AND ORDERING CO-EXISTING IN MOCVD  $\text{In}_x\text{Ga}_{1-x}\text{N}$   
**M.K. Behbehani, E.L. Piner, X. Liu, N.A. El-Masry, S.M. Bedair**
- Mo\_P071** MOCVD GROWTH AND CHARACTERIZATION OF GaN FILMS WITH COMPOSITE INTERMEDIATE LAYER BUFFER ON Si SUBSTRATE  
**X. Zhang, S.J. Chua, Z.C. Feng, J. Chen, J. Lin**
- Mo\_P072** THE NATURE OF NATIVE DEFECTS IN GaN THIN FILMS  
**V. Bondar, V. Vasylytsiv, I. Kucharsky, Yu. Dubov**
- Mo\_P073** DETERMINING OF STRESSES IN GaN THIN FILMS BY X-RAY DIFFRACTION ANALYSIS  
**L. Axelrud, V. Bondar, V. Davydov, I. Kucharsky**
- Mo\_P074** MICROSTRUCTURAL ANALYSIS OF POST-ANNEALED AlN NUCLEATION LAYERS  
**Y.M. Le Vaillant, R. Bisaro, P. Vennéguès, P. Galtier, J.Y. Duboz, B. Gil, S. Ruffenach-Clur, O. Briot, R.L. Aulombard**
- Mo\_P075** IN-EDGE X-RAY ABSORPTION FINE STRUCTURE OF INN AND INGAN FILMS  
**K.P. O'Donnell, R.W. Martin, M.E. White, J.F.W. Mosselmans, Qixin Guo**
- Mo\_P076** SPECTROSCOPIC IMAGING OF InGaN LAYERS  
**K.P.O'Donnell, C. Trager Cowan, S. Pereira, A. Bangura, C. Young, M.E. White, M.J. Tobin**
- Mo\_P077** COMPOSITION ANALYSIS USING ERD  
**L. Görgens, G. Dollinger, A. Bergmaier, O. Ambacher, L. Eastman, R. Dimitrov, A. Mitschel**
- Mo\_P078** THE ATOMIC STRUCTURE OF THREADING DISLOCATIONS FROM LOW-ANGLE TO HIGH-ANGLE GRAIN BOUNDARIES IN GaN/SAPPHIRE EPITAXIAL LAYERS  
**V. Potin, G. Nouet, P. Ruterana, R.C. Pond**
- Mo\_P079** SELF-ARRANGED LAYER STACKING SEQUENCE WITH SIX-BILAYER PERIODICITY ALONG THE  $\langle 111 \rangle$  DIRECTION IN GaN ON GaAs  
**M. Funato, T. Ishido, Sz. Fujita, Sg. Fujita**
- Mo\_P080** DEFECT-SELECTIVE ETCHING OF GaN  
**J.L. Weyher, G. Nowak, P.D. Brown, J.L. Rouvière, A. Presz, I. Grzegory**
- Mo\_P081** STRAIN DISTRIBUTION IN GAN HEXAGONS MEASURED BY RAMAN SPECTROSCOPY  
**R. Seitz, T. Monteiro, E. Pereira, M. Di Poisson-Forte**
- Mo\_P082** MICRO DEFECTS IN NEARLY DISLOCATION FREE GaN DOPED WITH Mg DURING HIGH PRESSURE CRYSTALLIZATION  
**S. Porowski, J. Kozubowski, J. Borysiuk, J.L. Weyher, M. Bockowski, B. Lucznik, I. Grzegory**
- Mo\_P083** INVESTIGATION OF GaN THIN FILMS BY HIGH RESOLUTION DOUBLE CRYSTAL X- RAY DIFFRACTION  
**D. Johnston, T. Lafford, G. Fraser, N. Loxley**
- Mo\_P084** DEFECT CREATION AND ANNIHILATION IN III-N LAYERS ON GaN SINGLE CRYSTALS AND ON SAPPHIRE  
**M. Leszczynski, P. Prystawko, T. Suski, E. Frayssinet, J. Domagala, G. Nowak, I. Grzegory, M. Bockowski, S. Porowski**
- Mo\_P085** HRTEM EVALUATION OF GaN LATERALLY OVERGROWN ON HVPE AlN/6H-SiC  
**P. Ruterana, B. Beaumont, P. Gibart, Yu. Melnik**
- Mo\_P086** ANALYSIS OF THE DEFECT STRUCTURE OF EPITAXIAL GaN LAYERS  
**H. Heinke, V. Kirchner, S. Einfeldt, D. Hommel**
- Mo\_P087** ORIGIN OF THE TILT OF CRYSTALLINE AXIS IN TERMS OF THE STRUCTURAL PROPERTY IN CUBIC GaN EPILAYER ON (001) GaAs SUBSTRATE GROWN BY RF-MBE  
**H. Hayashi, A. Hayashida, A.W. Jia, M. Kobayashi, M. Shimotomai, Y. Kato, A. Yoshikawa, K. Takahashi**
- Mo\_P088** IN-SITU Er-DOPING OF GaN AND THE EFFECT OF SURFACE MORPHOLOGY AN ROOM-TEMPERATURE PHOTOLUMINESCENCE  
**J.M. Zavada, M.E. Overberg, J. Brand, J.D. MacKenzie, C.R. Abernathy, S.J. Pearton, R.G. Wilson**
- Mo\_P089** GaN LAYERS GROWN ON Si(111) SUBSTRATES WITH AlN BUFFER LAYERS: A SCANNING TUNNELING MICROSCOPY INVESTIGATION IN AIR  
**R. Rinaldi, S. Antonaci, R. Cingolani, A. Botchkarev, H.Morkoç**

- Mo\_P090** THERMODYNAMIC ANALYSIS ON THE MOVPE GROWTH OF NITRIDE SEMICONDUCTORS USING HYDRAZINE  
**A. Koukitu, Y. Kumagai, H. Seki, N. Kubota**
- Mo\_P091** SURFACE ENERGIES AND SURFACE DIPOLES AT III-NITRIDE(111) SURFACES IN DEPENDENCE ON STOICHIOMETRY  
**J. Furthmüller, U. Grossner, F. Bechstedt**
- Mo\_P093** AB INITIO CALCULATION OF VIBRATIONAL PROPERTIES OF CUBIC AND HEXAGONAL InN  
**H.W. Leite Alves, J.L.A. Alves, A. Tabata, L.M.R. Scolfaro, J.R. Leite**
- Mo\_P094** POLARIZATION EFFECTS ON SCHOTTKY BARRIER IN GaN-METAL JUNCTIONS  
**P. Ruggerone, F. Bernardini, D. Mura, V. Fiorentini**
- Mo\_P095** STUDY OF PHASE-SEPARATED THIN LAYERS OF INGAN GROWN BY METALORGANIC-VAPOR-PHASE-EPITAXY  
**P. Li, G. Li, S.J. Chua, W. Wang, X.C. Wang, Y.P. Guo**
- Mo\_P096** EVOLUTION WITH TEMPERATURE OF THE STRAIN STATE OF GaN THIN LAYERS GROWN ON DIFFERENT SUBSTRATES  
**E. Deleporte, C. Guénaud, M. Voos, B. Beaumont, P. Gibart, H. Larèche**
- Mo\_P097** PHOTOLUMINESCENCE INVESTIGATIONS OF AlGaIn ON GaN EPITAXIAL FILMS  
**B.K. Meyer, G. Steude, H. Amano, I. Akasaki**
- Mo\_P098** PHONONS IN HEXAGONAL InN. EXPERIMENT AND THEORY  
**V.Yu. Davydov, A.A. Klochikhin, M.B. Smirnov, V.V. Emtsev, V.D. Petrikov, I.A. Abroyan, I.N. Goncharuk, A.N. Smirnov, V.V. Mamutin, S.V. Ivanov, T. Inushima**
- Mo\_P099** INFRARED PHOTOLUMINESCENCE AND EPR IN BULK GaN CRYSTALS HEAVILY DOPED WITH Cr AND V  
**I.V. Ilyin, R.A. Babunts, P.G. Baranov, E.N. Mokhov, V.A. Khrantsov**
- Mo\_P100** OBSERVATION OF PHONON MODES IN BULK InGaIn FILMS BY RAMAN SCATTERING  
**H. Harima, Y. Sone, E. Kurimoto, S. Nakashima, S. Chu, A. Ishida, H. Fujiyasu**
- Mo\_P101** LOCAL VIBRATIONAL MODES IN p-TYPE GaN OBSERVED BY RAMAN SCATTERING  
**H. Harima, T. Inoue, Y. Sone, S. Nakashima, M. Ishida, M. Taneya**
- Mo\_P102** DISLOCATION NATURE OF GROWTH HILLOCKS IN HOMOEPITAXIAL MOCVD GaN LAYERS  
**G. Nowak, K. Pakula, I. Grzegory, J.L. Weyher, S. Porowski**
- Mo\_P103** OXYGEN-RELATED DEFECTS AND ENERGY ACCUMULATION IN ALUMINIUM NITRIDE CERAMICS  
**B. Berzina, L. Trinkler, J. Sils, E. Palcevskis, P. Christensen**
- Mo\_P104** REAL-TIME X-RAY SCATTERING STUDIES OF SURFACE STRUCTURE AND GROWTH MODES DURING MOCVD GROWTH OF GaN  
**G.B. Stephenson, A. Munkholm, J.A. Eastman, C. Thompson, P. Fini, J.S. Speck, O. Auciello, S.P. DenBaars**
- Mo\_P105** HIGH QUALITY GaN LAYERS GROWN BY MOCVD ON Si(111) – SUBSTRATES  
**A. Strittmatter, A. Krost, D. Bimberg**



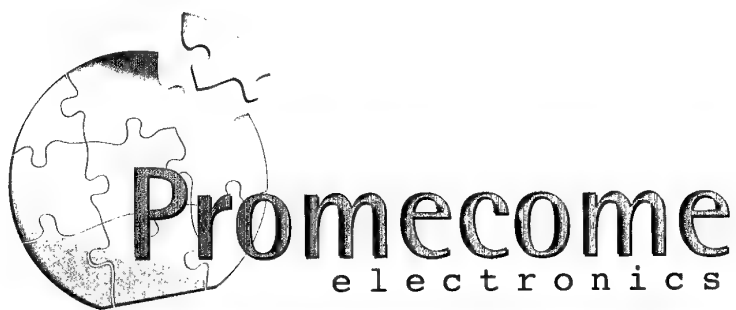
Morton International, Inc.  
Performance Chemicals Metalorganics

60 Willow Street  
North Andover, MA 01845 – USA  
Tel : +1 978 557 1700 / Fax : +1 978 557 1701 / Web : [www.metalorganics.com](http://www.metalorganics.com)

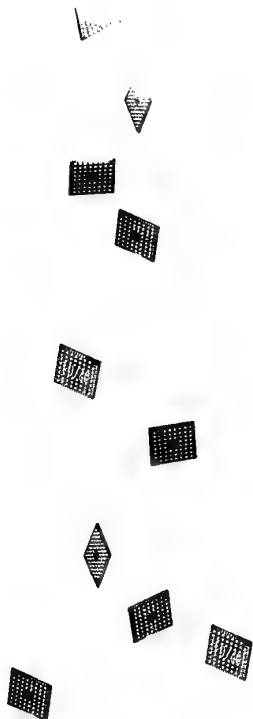
Morton International is a leading supplier of ultra high purity metalorganic precursors for MOVPE and related film growth technologies used in the manufacture of compound semiconductors. Specific purification techniques ensure minimal oxygen and organic contaminant levels needed for the most demanding optoelectronic applications.

With recent capital investments in a new world class manufacturing and research facility, state-of-the-art analytical instrumentation, advanced purification and a focus on global manufacturing expansion, Morton is committed to a long-term leadership position in this market.

Morton International is a diversified multi-billion dollar international corporation, and holds global leadership positions in two major industries : Specialty chemicals and salt.



FROM SAND TO PACKAGES



**Silicon Wafers**  
UNISIL

**Gallium Arsenide wafers**  
FREIBERGER\*

**GaAs-InP Reclaim**  
III-V's RECLAIM

**Ge, GaP, GaSb, InP, InAs, InSb Wafers, Polycrystals**  
II-VI Compounds  
ATRAMET

**Sulphur, Selenium, Tellurium and Compounds**  
FURUKAWA

**Arsenic\*\* MBE 7n5 shaped charges**  
**7n5, 7n, 6n chunks** for GaAs crystal growth and implant sources  
FURUKAWA

**Gallium\*\*\* MBE 7n+ ingot and bottles**  
**7n, 6n grade** for GaAs crystal growth  
RHODIA

**Gallium Recycling** from Ga, GaAs scraps

**Indium MBE 7n+ ingot and shot**  
**6n, 7n grade** for InP crystal growth  
RASA

**Phosphorous red MBE 7n ingot**  
**6n, 7n chunks** for InP crystal growth  
RASA

**Aluminium\*\*\*\*\* MBE 6n5 ingots**  
PECHINEY HIGH PURITY

NEW

**Beryllium MBE 5n+ lumps**  
ATOMERGIC

**Bi, Cd, Pb, Sb, Sn, Te, Zn, Se, Th 6 or 6n+ pieces**  
AMC

**PBN crucibles, pieces, PG**  
SINTEC CVD

**Bonding Adhesives**  
KSMULLER-TRACON

**Bonding Wires**  
KSMULLER

**Bonding Caps-Wedges, Blades, Bga, Csp**  
**Micro-Spheres TM\*\*\*\***  
KS MICROSWISS

**Chip Scale Packaging**  
SHELLCASE

\*Sole Agent for Europe except Austria and Germany \*\*Sole Agent for Europe \*\*\*Sole Agent for Europe except France  
\*\*\*\*Sole Agent for France, Belgium, Morocco, Hungary, Czech Republic \*\*\*\*\*Worldwide Agent

**WWW.PROMECE.COM**

B.P. 29 - F-75560 Paris Cedex 12 - 68, avenue du Général Michel Bizot - 75012 Paris - France - EC  
Phone direct : 0033 (1) 44 73 10 70 - Fax direct : 0033 (1) 44 73 10 53 - E-mail : s83325@a-arnaud.fr

## POSTER SESSION 2

**Tuesday July 6<sup>th</sup>**

- Tu\_P001** SOLID INCORPORATION OF AlGa<sub>N</sub> AND INFLUENCE OF GROWTH INTERRUPTION ON GaN/AlGa<sub>N</sub> QUANTUM WELL STRUCTURES GROWN BY MOCVD  
**G.M. Yang, S.C. Choi, J.H. Kim, J.Y. Choi, K.J. Lee, K.Y. Lim, H.J. Lee**
- Tu\_P002** METALORGANIC MOLECULAR BEAM EPITAXY OF In<sub>x</sub>Ga<sub>1-x</sub>N FOR A VISIBLE SPECTRAL RANGE IN PHOTOLUMINESCENCE  
**Seong-Ju Park, Min-Ho Kim, Jun-Kyu Cho**
- Tu\_P003** PROPERTIES OF NANOCRYSTALLINE GALLIUM NITRIDE THIN FILMS GROWN ON MONOCRYSTALLINE SUBSTRATES AND BUFFER LAYERS  
**V. Bondar**
- Tu\_P004** GROWTH AND OPTICAL CHARACTERIZATION OF In<sub>x</sub>Ga<sub>1-x</sub>N DOTS RESULTING FROM A 2D-3D TRANSITION  
**C. Adelmann, J. Simon, N. Pelekanos, Y. Samson, G. Feuillet, B. Daudin**
- Tu\_P005** InGa<sub>N</sub>/Ga<sub>N</sub> MQW AND Mg-DOPED Ga<sub>N</sub> GROWTH USING A SHUTTER CONTROL METHOD BY RF-MOLECULAR BEAM EPITAXY  
**Shinichi Nakamura, Akihiko Kikuchi, Koichi Kushi, Hajime Sasamoto, Daisuke Sugihara, Kazuhide Kusakabe, Katsumi Kishino**
- Tu\_P006** ENHANCED BLUE-LIGHT EMISSION FROM InGa<sub>N</sub>/Ga<sub>N</sub> QUANTUM WELLS GROWN OVER A MULTILAYERED BUFFER ON SILICON SUBSTRATE BY METAL ORGANIC CHEMICAL VAPOR DEPOSITION  
**Xiong Zhang, Soo-Jin Chua, Wei Liu**
- Tu\_P007** GROWTH AND CHARACTERIZATION OF THICK GaAs<sub>N</sub> EPILAYERS AND GaInNAs/GaAs MULTIQUANTUM WELLS  
**Ph. Gilet, A. Chenevas-Paule, Ph. Duvaut, L. Grenouillet, A. Million**
- Tu\_P008** THE STRUCTURE OF InGa<sub>N</sub> LAYERS AND QUANTUM WELLS GROWN BY MOCVD  
**P. Ruterana, C. Gonthrin, F. Mascle, R. Aguinet, M.A. Poisson, W. Van der Stricht**
- Tu\_P009** GROWTH AND RELAXATION OF Ga<sub>N</sub>/AlGa<sub>N</sub> HETEROSTRUCTURES GROWN BY MBE ON PRESSURE GROWN GaN(0001) SUBSTRATES  
**M. Albrecht, H.P. Strunk, C.T. Foxon, D. Korakakis, I. Grzegory, S. Porowski**
- Tu\_P010** INFLUENCE OF STRAIN AND THERMAL ANNEALING EFFECTS ON BANDGAP INHOMOGENEITY OF InGa<sub>N</sub> MQW  
**K. Domen, A. Kuramata, T. Tanahashi**
- Tu\_P011** IMPROVEMENT OF SURFACE MORPHOLOGY IN InGa<sub>N</sub> MULTIPLE QUANTUM WELL STRUCTURE  
**J. Gotoh, K. Uchida, A. Niwa, S. Gotoh, T. Yang, J. Kasai, T. Mishima**
- Tu\_P012** DISLOCATIONS IN Ga<sub>N</sub> and Ga<sub>N</sub>/Al<sub>N</sub> HETEROSTRUCTURES  
**J.L. Rouvière, B. Daudin, G. Feuillet, J.L. Weyher**
- Tu\_P013** CONTROL OF SPATIAL FLUCTUATIONS IN InGa<sub>N</sub>/Ga<sub>N</sub> QUANTUM WELLS BY MOLECULAR BEAM EPITAXY GROWTH  
**S. Einfeldt, T. Bottcher, D. Rudloff, T. Riemann, F. Bertram, H. Selke, J. Christen, P.L. Ryder, D. Hommel**
- Tu\_P014** STRUCTURAL DEFECTS OF CUBIC InGa<sub>N</sub>/Ga<sub>N</sub> HETEROSTRUCTURES GROWN ON GaAs (001) SUBSTRATES BY MOVPE  
**Y. Taniyasu, Y. Watanabe, D. H. Lim, A.W. Jia, M. Shimotomai, Y. Kato, M. Kobayashi, A. Yoshikawa, K. Takahashi**
- Tu\_P015** TIME-RESOLVED SPECTROSCOPY OF InGa<sub>N</sub> LIGHT-EMITTING DIODES, MULTIPLE QUANTUM WELLS, AND THIN FILMS  
**Frederick H. Long, M. Pophristic, C. Tran, R.F. Karlicek Jr., I.T. Ferguson**
- Tu\_P016** INHOMOGENEOUS BROADENING OF EXCITONS IN THIN FILMS OF Ga<sub>N</sub> : EFFECT ON THE TIME RESOLVED TRANSMISSION SPECTRA  
**A.V. Kavokin, G. Malpuech, G. Panzarini**
- Tu\_P017** OPTICAL PROPERTIES OF HEXAGONAL Ga<sub>N</sub> CRYSTALS WITH IMPURITIES AND DEFECTS  
**P. Tronc, Yu.E. Kitaev, G. Wang, M.F. Limonov, G.Neu**
- Tu\_P018** EXTENDED TIGHT BINDING AND THERMOCHEMICAL MODELING OF III-NITRIDE HETEROSTRUCTURES AS A FUNCTION OF TEMPERATURE, STRAIN, AND PRESSURE  
**Hilmi Ünlü**
- Tu\_P019** CALCULATION OF EXCITON ENERGIES FOR SELF-FORMED INGAN QUANTUM DOTS  
**R.W. Martin, K.P. O'Donnell**

<b>Tu_P020</b>	OPTICAL PROPERTIES OF GaN (110) AND (1010) SURFACES <b>Cecilia Noguez, R. Esquivel-Sirvent</b>
<b>Tu_P021</b>	STRAIN INFLUENCE ON III-NITRIDES: AB INITIO STUDIES OF STRUCTURAL, LATTICE-DYNAMICAL, AND DIELECTRIC PROPERTIES <b>J.M. Wagner, F. Bechstedt</b>
<b>Tu_P022</b>	RELAXATION EFFECTS ON THE NEGATIVELY CHARGED Mg IMPURITY IN ZINC BLENDE GaN <b>L.M.R. Scolfaro, L.K. Teles, J.R. Leite, A. Tabata, D.J.As</b>
<b>Tu_P023</b>	INFLUENCE OF INTERNAL POLARIZATION FIELDS ON THE DISORDER BROADENING OF EXCITONS IN (In,Ga)N/GaN QUANTUM WELLS <b>O. Mayrock, H.J. Wünsche, F. Henneberger, O. Brandt</b>
<b>Tu_P024</b>	EFFECTS OF MACROSCOPIC-POLARIZATION INDUCED ELECTROSTATIC FIELDS IN III-V NITRIDE MULTI-QUANTUM-WELLS <b>Vincenzo Fiorentini, Fabio Bernardini, A. Di Carlo, F. Della Sala, P. Lugli</b>
<b>Tu_P025</b>	FIRST-PRINCIPLES STUDY ON PIEZOELECTRIC CONSTANTS IN BN, AlN, AND GaN DISTORTED BY VOLUME-CONSERVING AND BIAxIAL STRAINS <b>K. Shimada, T. Sota, K. Suzuki, H. Okumura</b>
<b>Tu_P026</b>	TWO-PHOTON ABSORPTION IN GaAlN NANOCRYSTALLITES EMBEDDED WITHIN PHOTOPOLYMER MATRICES <b>A. Mefleh, S. Benet, S. Brunet, M. Malachowski, I.V. Kityk</b>
<b>Tu_P027</b>	TEMPERATURE DEPENDENCE OF HEXAGONAL-GaN OPTICAL PROPERTIES BELOW THE BANDGAP <b>L. Sizade, S. Colard, M. Mihailovic, J. Leymarie, A. Vasson, N. Grandjean, M. Leroux, J. Massies</b>
<b>Tu_P028</b>	TEMPERATURE DEPENDENCE OF PHOTOLUMINESCENCE INTENSITIES IN UNDOPED AND DOPED GaN <b>M. Leroux, N. Grandjean, B. Beaumont, G. Nataf, F. Sémond, J. Massies, P. Gibart</b>
<b>Tu_P029</b>	OBSERVATION OF QUANTUM DOT/QUANTUM WIRE-LIKE PROPERTIES IN THE PHASE-SEPARATED GaN-RICH GaNP <b>R. Kuroiwa, H. Asahi, K. Iwata, H. Tampo, K. Asami, S. Gonda</b>
<b>Tu_P030</b>	OPTICAL CONSTANTS OF Al <sub>x</sub> Ga <sub>1-x</sub> N: MODELING OVER A WIDE SPECTRAL RANGE <b>A.B. Djurišić, E.H. Li</b>
<b>Tu_P031</b>	STRAINED InGa <sub>N</sub> /Ga <sub>N</sub> QUANTUM WELLS CHARACTERISED BY ROOM-TEMPERATURE PHOTOLUMINESCENCE AND SPECTROSCOPIC ELLIPSOMETRY <b>A. Ramakrishnan, J. Wagner, H. Obloh, M. Kunzer</b>
<b>Tu_P032</b>	DYNAMICS OF THE BOUND EXCITONS IN GaN epilayers grown by hydride vapor phase epitaxy <b>G. Pozina, J.P. Bergman, T. Paskova, B. Monemar</b>
<b>Tu_P033</b>	OPTICAL AND STRUCTURAL CHARACTERIZATION OF Ga(In) <sub>N</sub> THREE-DIMENSIONAL NANOSTRUCTURES GROWN BY PLASMA ASSISTED MOLECULAR BEAM EPITAXY <b>G. Pozina, J.P. Bergman, B. Monemar, V.V. Mamutin, V.A. Vekshin, S.V. Ivanov, T.V. Shubina, A.A. Toropov</b>
<b>Tu_P034</b>	HOT CARRIER RELAXATION BY EXTREME ELECTRON – LO PHONON SCATTERING IN GaN <b>S. Hess, R.A. Taylor, E.D. O'Sullivan, J.F. Ryan, N.J. Cain, V. Roberts, J.S. Roberts</b>
<b>Tu_P035</b>	FEMTOSECOND EXCITON DYNAMICS AND THE MOTT TRANSITION IN GaN UNDER RESONANT EXCITATION <b>R.A. Taylor, S. Hess, K. Kyhm, J.F. Ryan, B. Beaumont, P. Gibart</b>
<b>Tu_P036</b>	VIOLET TO ORANGE ROOM TEMPERATURE LUMINESCENCE FROM GaN QUANTUM DOTS ON Si(111) SUBSTRATES <b>B. Damilano, N. Grandjean, F. Semond, J. Massies, M. Leroux</b>
<b>Tu_P037</b>	CHARACTERIZATION OF InGa <sub>N</sub> SINGLE LAYERS AND QUANTUM WELLS GROWN BY LP-MOVPE <b>B. Schineller, P.H. Lim, O. Schön, H. Protzmann, M. Heuken, K. Heime</b>
<b>Tu_P038</b>	IMPACT IONIZATION OF EXCITONS IN AN ELECTRIC FIELD IN GaN <b>D.K. Nelson, M.A. Jacobson, V.D. Kagan, N. Shmidt</b>
<b>Tu_P039</b>	CRYSTAL FILMS CHARACTERIZATION BY URBACH SPECTRAL TAIL OF ABSORPTION FOR GALLIUM NITRIDE <b>M.A. Jacobson, O.V. Konstantinov, D.K. Nelson, S.O. Romanovskii, Z. Hatzopoulos, A. Georgakilas</b>
<b>Tu_P040</b>	INFLUENCE OF THE ELECTRIC FIELD ON THE EXCITONIC SPECTRA OF EPITAXIAL GaN FILMS <b>M.A. Jacobson, E.V. Kalinina, D.K. Nelson, S.O. Romanovskii, A.V. Sel'kin</b>

- Tu\_P041** OPTICAL STUDY OF CUBIC GALLIUM NITRIDE BAND-EDGE AND RELATION WITH RESIDUAL STRAIN  
**A. Philippe, C. Bru-Chevallier, H. Gamez-Cuatzin, G. Guillot, E. Martinez-Guerrero, G. Feuillet, B. Daudin, P. Aboughe'Nze, Y. Monteil**
- Tu\_P042** OPTICAL PROPERTIES OF AN AlInN INTERFACE LAYER SPONTANEOUSLY FORMED IN HEXAGONAL InN/ SAPPHIRE HETEROSTRUCTURES  
**T.V. Shubina, V.V. Mamutin, V.A. Vekshin, V.V. Ratnikov, A.A. Toropov, S.V. Ivanov, M. Karlsteen, U. Södervall, M. Willander, G.R. Pozina, B. Monemar**
- Tu\_P043** HIGH-TEMPERATURE LASING IN InGaN/GaN MULTIQUANTUM WELL HETEROSTRUCTURES  
**I.P. Marko, E.V. Lutsenko, V.N. Pavlovskii, G.P. Yablonskii, O. Schön, H. Protzman, M. Lünenbürger, M. Heuken, B. Schineller, K. Heime**
- Tu\_P044** RED LUMINESCENCE OF Mg-DOPED GaN  
**M.W. Bayerl, M.S. Brandt, E.R. Glaser, A.E. Wickenden, D.D. Koleske, R.L. Henry, M. Stutzmann**
- Tu\_P045** EXCITATION DENSITY DEPENDENCE OF PHOTOLUMINESCENCE AND BARRIER DOPING EFFECT IN  $\text{In}_x\text{Ga}_{1-x}\text{N}$  QUANTUM WELLS  
**Eunsoon Oh, C.S. Sone, Hyeongsoo Park, O.H. Nam, Yongjo Park**
- Tu\_P046** INFRARED REFLECTANCE INVESTIGATION OF UN-DOPED AND Si-DOPED GaN FILMS ON SAPPHIRE  
**Z.C. Feng, Y.T. Hou, M.F. Li, S.J. Chu, W. Wang, L. Zhu**
- Tu\_P047** OPTICAL BAND GAP DEPENDENCE ON THICKNESS AND COMPOSITION OF  $\text{In}_x\text{Ga}_{1-x}\text{N}$  GROWN ON GAN  
**C.A. Parker, M.J. Reed, J.C. Roberts, S.X. Liu, N.A. El-Masry, S.M. Bedair**
- Tu\_P048** OPTICAL CHARACTERIZATION OF CUBIC AlGaIn EPILAYERS BY CATHOOLUMINESCENCE AND SPECTROSCOPIC ELLIPSOMETRY  
**H. Okumura, T. Koizumi, Y. Ishida, H. Yaguchi, S. Yoshida, S. Chichibu**
- Tu\_P049** STRUCTURAL AND OPTICAL ANALYSIS OF (In,Ga)N STRUCTURES GROWN BY MOCVD  
**D. Rudloff, J. Bläsing, T. Riemann, J. Christen, A. Krost, M. Lünenbürger, H. Protzmann, M. Heuken**
- Tu\_P050** NEAR-BAND GAP SELECTIVE PHOTOLUMINESCENCE IN WURTZITE GaN  
**G. Neu, M. Teisseire, B. Beaumont, P. Gibart**
- Tu\_P051** TIME-RESOLVED PHOTOLUMINESCENCE OF CUBIC GaN GROWN BY METALORGANIC VAPOR PHASE EPITAXY  
**H. Yaguchi, J. Wu, H. Akiyama, M. Baba, K. Onabe, Y. Shiraki**
- Tu\_P052** PHOTOLUMINESCENCE EXCITATION SPECTRUM STUDY ON GaN/Al<sub>0.15</sub>Ga<sub>0.85</sub>N MQWS  
**T. Nishida, M. Kumagai, H. Ando, N. Kobayashi**
- Tu\_P053** HOT ELECTRONS AND HOLES IN HIGHLY PHOTOEXCITED GaN EPILAYERS  
**A. Zukauskas, G. Tamulaitis, R. Gaska, M.S. Shur, M.A. Khan, J.W. Yang**
- Tu\_P054** FINITE-TEMPERATURE BAND-GAP RENORMALIZATION IN HIGHLY PHOTOEXCITED GaN EPILAYERS  
**A. Zukauskas, S. Jursenas, G. Kurilcik, G. Tamulaitis, M.S. Shur, R. Gaska, J.W. Yang, M.A. Khan**
- Tu\_P055** InGaIn/GaN/AlGaIn VERTICAL CAVITY SURFACE EMITTING LASER OPERATING AT ROOM TEMPERATURE AT OPTICAL PUMPING  
**I.L. Krestnikov, W.V. Lundin, A.V. Sakharov, V.A. Semenov, A.S. Usikov, A.F. Tsatsul'nikov, N.N. Ledentsov, A. Hoffmann, Zh.I. Alferov, D. Bimberg**
- Tu\_P056** AN INVESTIGATION INTO THE ORIGIN OF THE 3.424 eV PEAK IN THE LOW TEMPERATURE PHOTOLUMINESCENCE OF GaN GROWN BY MOLECULAR BEAM EPITAXY  
**A. Bell, C.T. Foxon, I. Harrison, T. Cheng, D. Korakakis, S. Novikov, B. Ya Ber, Y.A. Kudriavtsev**
- Tu\_P057** GREEN EMISSION FROM Tb-DOPED GaN GROWN BY MOVPE  
**Kazuhiko Hara, Nobuyuki Ohtake**
- Tu\_P058** EXCITONIC THERMALIZATION, TRANSPORT AND RECOMBINATION IN HOMOEPITAXIAL GALLIUM NITRIDE  
**K.P. Korona, J. Kuhl, J.M. Baranowski, S. Porowski**
- Tu\_P060** FAR-INFRARED REFLECTIVITY INVESTIGATIONS ON GaN SINGLE CRYSTALS AND HOMOEPITAXIAL LAYERS  
**E. Frayssine, W. Knap, P. Prystawko, M. Leszczynski, B. Beaumont, T. Suski, P. Wisniewski, E. Litwin-Staszewska, S. Porowski**
- Tu\_P061** A STUDY ON THE SILANE DOPING OF HETERO-EPITAXIAL MOCVD GROWN GaN  
**P.R. Hageman, M.A.C. Devillers, A.R.A. Zauner, V. Kirilyuk, W.S. Bouwens, R.C.M. Crane, P.K. Larsen**
- Tu\_P062** DETERMINATION OF OPTICAL CONSTANTS FOR CUBIC  $\text{In}_x\text{Ga}_{1-x}\text{N}$   
**R. Goldhahn, J. Scheiner, S. Shokhovets, T. Frey, U. Köhler, D. As**

- Tu\_P063** EMISSION DUE TO EXCITON SCATTERING BY LO PHONONS IN GALLIUM NITRIDE  
**M.Wojdak, A.Wysmolek, K.Pakula, J.M.Baranowski**
- Tu\_P064** FREE-CARRIER AND CRYSTAL-STRUCTURE PROPERTIES OF GROUP III-NITRIDE HETEROSTRUCTURES MEASURED BY INFRARED ELLIPSOMETRY  
**M. Schubert, J.A. Woollam, A. Kassig, B. Rheinländer, J. Off, F. Scholz**
- Tu\_P065** EVIDENCE FOR SPONTANEOUS POLARIZATION EFFECTS IN GaN/AlGaN QUANTUM WELLS  
**J. Simon, R. Langer, A. Barski, N.T. Pelekanos**
- Tu\_P066** IMPROVEMENT OF THE SPATIALLY INHOMOGENEOUS OPTICAL PROPERTIES OF GaN FILMS BY INDIUM DOPING DURING GAS-SOURCE MOLECULAR BEAM EPITAXY  
**Ken-ichi Hoshi, Satoru Tanaka, Hidekazu Kumano, Ikuo Suemune, Xu-Qiang Shen, Peter Ramvall, Yoshinobu Aoyagi**
- Tu\_P067** POLARISED MAGNETOLUMINESCENCE OF EXCITONS IN HOMOEPITAXIAL GaN LAYERS  
**A. Wysmolek, M. Potemski, R. Stepniewski, J. Lusakowski, K. Pakula, J.M. Baranowski, G. Martinez, P. Wyder, I. Grzegory, S. Porowski**
- Tu\_P068** MAGNETO-OPTICS OF BULK GALLIUM NITRIDE  
**P.A. Shields, R.J. Nicholas, B. Beaumont, P. Gibart**
- Tu\_P069** THE OPTICAL PROPERTIES AND RESIDUAL STRAIN OF THICK GaN FILMS WITH DIFFERENT THICKNESS USING PHOTOLUMINESCENCE (PL) AND PHOTOREFLECTANCE (PR)  
**S.W. Park, J.W. Lee, P.W. Yu, J.B. Yoo**
- Tu\_P070** EFFECT OF AN ELECTRIC FIELD ON THE ELECTROLUMINESCENCE AND THE PHOTOCURRENT IN InGaN SINGLE QUANTUM WELLS LIGHT EMITTING DIODES  
**P. de Mierry, B. Beaumont, S. Dalmaso, M. Leroux, P. Gibart**
- Tu\_P071** PHOTOLUMINESCENCE DYNAMICS IN STRAINED AlGaIn/GaN QUANTUM WELLS  
**R. Gaska, M.S. Shur, A. Bykhovski, G. Tamulaitis, A. Zukauskas, S. Jursenas, G. Kurilcik, M.A. Khan, J.W. Yang**
- Tu\_P072** OPTICAL CHARACTERISTICS OF AlGaIn, GaN, AND InGaIn THIN FILMS: A COMPARISON AND TEMPERATURE DEPENDENCE  
**Yong-Hoon Cho, T.J. Schmidt, G.H. Gainer, J.B. Lam, J.J. Song, S. Keller, U.K. Mishra, S.P. DenBaars, W. Yang, D.S. Kim, W. Jhe**
- Tu\_P073** MULTIPHONON RESONANT RAMAN SCATTERING IN GaN/Al<sub>x</sub>Ga<sub>1-x</sub>N QUANTUM WELLS  
**F. Demangeot, J. Gleize, J. Frandon, M.A. Renucci, M. Kuball, N. Grandjean, J. Massies**
- Tu\_P074** PHOTOLUMINESCENCE DYNAMICS OF GaInN/GaN QUANTUM WELLS WITH DIFFERENT In CONCENTRATIONS  
**M. Klose, K.P. Korona, J. Kuhl, M. Heuken**
- Tu\_P075** STRONG PHOTOLUMINESCENCE EMISSION FROM GaN ON SrTiO<sub>3</sub> SUBSTRATE  
**H. Tampo, H. Asahi, M. Hiroki, K. Asami, S. Gonda**
- Tu\_P076** INFLUENCE OF BARRIER DOPING AND BARRIER COMPOSITION ON OPTICAL GAIN IN (In,Ga)N MQWs  
**M. Vehse, P. Michler, J. Gutowski, S. Figge, D. Hommel, H. Selke, P. Ryder, S.P. DenBaars**
- Tu\_P077** RAMAN SCATTERING IN GaN/AlN QUANTUM DOT STRUCTURES  
**J. Gleize, F. Demangeot, J. Frandon, M.A. Renucci, M. Kuball, F. Widmann, B. Daudin**
- Tu\_P078** POLARIZATION FIELD EFFECTS AND INTERFACE STATES IN InGaIn SINGLE QUANTUM WELLS  
**J.C. Harris, S. Kako, T. Someya, Y. Arakawa**
- Tu\_P079** EXCITON ENERGY STRUCTURE IN WURTZITE GaN  
**A.V. Rodina, L. Eckey, M. Dietrich, A. Göldner, A.L. Efros, M. Rosen, A. Hoffmann, B.K. Meyer**
- Tu\_P080** OPTICAL PROPERTIES OF NITRIDE QUANTUM WELLS: HOW TO SEPARATE FLUCTUATIONS AND POLARIZATION FIELD EFFECTS
- Tu\_P081** **A. Hangleiter, J. S.Im, J. Off, F. Scholz**  
QUANTUM-CONFINED STARK EFFECT IN AN AlGaIn/GaN/AlGaIn SINGLE QUANTUM WELL STRUCTURE  
**T. Deguchi, K. Sekiguchi, A. Nakamura, T. Sota, R. Matsuo, S. Chichibu, S. Nakamura**
- Tu\_P082** REFLECTANCE DIFFERENCE SPECTROSCOPY CHARACTERIZATION OF Al<sub>x</sub>Ga<sub>1-x</sub>N-COMPOUND LAYERS  
**U. Rossow, D.E. Aspnes, O. Ambacher, V. Cimalla, N.V. Edward, M. Bremser, R.F. Davis, J.A. Schaefer, M. Stutzmann**
- Tu\_P083** OPTICAL NONLINEARITIES IN THE BAND EDGE REGION OF HIGHLY EXCITED (Al, In)GaIn THIN FILMS STUDIED VIA FEMTOSECOND AND NANOSECOND OPTICAL PUMP-PROBE SPECTROSCOPY  
**T.J. Schmidt, A.J. Fischer, J.B. Lam, J.J. Song**
- Tu\_P084** HIGHLY PHOTO-EXCITED NITRIDE QUANTUM WELLS: RENORMALIZATION OF THE BANDGAP AND OF THE EXCITON ENERGY  
**Pierre Bigenwald, Alexey Kavokin, Philippe Christol, Bernard Gil, Pierre Lefebvre**

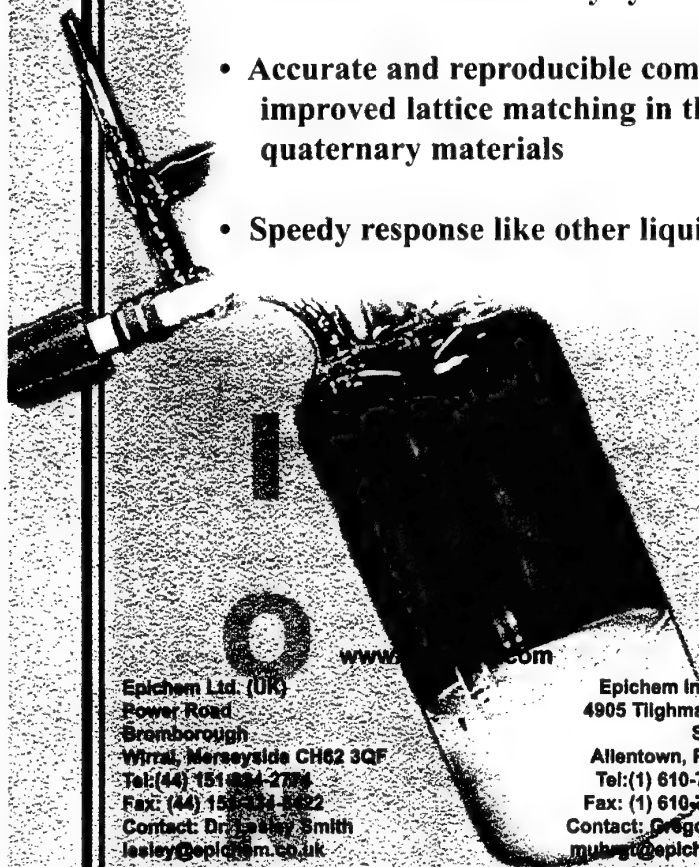
- Tu\_P085** A MODEL OF THE EFFICIENT UV EMISSIONS ENCOMPASSING TWO RECOMBINATION CENTERS IN  $\text{In}_x\text{Ga}_{1-x}\text{N}$  EPILAYERS  
H. Kudo, H. Ishibashi, R. Zheng, Y. Yamada, T. Taguchi
- Tu\_P086** INVESTIGATION OF PHOTOLUMINESCENCE PROPERTIES OF CUBIC-GaN MOCVD EPILAYERS GROWN ON GaAs(100) SUBSTRATES  
N. Moreaud, M. Moret, S. Ruffenach-Clur, O. Briot, J. Calas, R.L. Aulombard
- Tu\_P087** SPECTRAL STUDY OF PHOTOLUMINESCENCE FROM GaInN/GaN MQW USING CW AND TIME RESOLVED MEASUREMENT  
S. Watanabe, N. Yamada, T. Takeuchi, Y. Yamada, T. Taguchi, H. Amano, I. Akasaki
- Tu\_P088** MAGNETO-LUMINESCENCE AND TIME-RESOLVED LUMINESCENCE OF EXCITONIC TRANSITIONS IN HOMOEPITAXIAL GaN LAYERS  
Y. Yamada, S. Kurai, T. Taguchi, T. Sugahara, K. Nishino, S. Sakai
- Tu\_P089** CW AND TIME-RESOLVED OPTICAL SPECTROSCOPY OF GaN EPILAYERS AND GaN-AlGaIn QUANTUM WELLS GROWN ON A-PLANE SAPPHIRE  
M. Gallart, T. Taliercio, Andenet Alemu, P. Lefebvre, B. Gil, J. Allègre, H. Mathieu, Shuji Nakamura
- Tu\_P090** SLOW SPIN-RELAXATION OBSERVED IN InGaIn/GaN MULTI-QUANTUM WELLS  
M. Julier, A. Vinattieri, M. Colocci, P. Lefebvre, B. Gil, D. Scalbert, C.A. Tran, R.F. Karlicek Jr.
- Tu\_P091** EXPERIMENTAL INVESTIGATION OF CUBIC TO HEXAGONAL RATIO FOR GaN LAYERS DEPOSITED ON 3C-SiC/Si  
J. Camassel, P. Vicente, N. Planes, J. Pankove, F. Namavar
- Tu\_P092** PHOTOREFLECTANCE SPECTROSCOPY INVESTIGATION OF GaN-AlGaIn QUANTUM WELL STRUCTURES  
Tomasz J. Ochalski, B. Gil, T. Bretagnon, P. Lefebvre, N. Grandjean, J. Massies, M. Leroux
- Tu\_P093** OPTICAL PROPERTIES OF AS-GROWN,  $\text{N}_2^+$ -ION IMPLANTED AND ALPHA-PARTICLE IRRADIATED GaN  
H.W. Kunert, S. Juillaguet, J. Camassel, J.B. Malherbe, D.J. Brink, L. Prinsloo
- Tu\_P094** EMISSION QUANTUM EFFICIENCY OF Eu DOPED GaN DETERMINED BY PHOTOCALORIMETRIC SPECTROSCOPY  
Takahiro Maruyama, Hitomi Sasaki, Shin-ichi Morishima, Katsuhiko Akimoto
- Tu\_P095** EVIDENCE FOR RELAXED GROWTH OF GaN ON SiC(0001): CORRELATION TO THE HETEROJUNCTION ELECTRONIC PROPERTIES  
R. Lantier, F. Boscherini, A. Rizzi, F. D'Acapito, S. Mobilio, H. Lüth
- Tu\_P096** IN-PLANE AND IN-DEPTH PROPERTIES OF GaN EPILAYERS AND GaN/AlGaIn QUANTUM WELL STRUCTURES STUDIED WITH SCANNING AND DEPTH-PROFILING CATHODOLUMINESCENCE  
M. Godlewski, E.M. Goldys, M.R. Phillips, R. Langer, A. Barski
- Tu\_P097** DEFECT COMPLEXES IN HIGHLY Mg-DOPED GaN STUDIED BY RAMAN SPECTROSCOPY  
A. Kaschner, H. Siegle, G. Kaczmarczyk, A. Hoffmann, C. Thomsen, U. Birkle, S. Einfeldt, D. Hommel
- Tu\_P098** OPTICAL AND STRUCTURAL STUDIES OF PHASE SEPARATION IN InGaIn FILM GROWN BY MOCVD  
Seong-Ju Park, Yong-Tae Moon, Dong-Joon Kim, Keun-Man Song  
PHOTOLUMINESCENCE MAPPING AND RUTHERFORD BACK SCATTERING OF InGaIn EPILAYERS  
K.P. O'Donnell, M.E. White, S. Pereira, M. Wu, A. Vantomme, W. Van der Stricht, K. Jacobs
- Tu\_P100** CATHODOLUMINESCENCE FROM InGaIn/GaN MQW GROWN ON AN EPITAXIALLY LATERAL OVERGROWN GaN EPILAYER  
C. Trager-Cowan, A. Mohammed, S.K. Manson-Smith, K.P. O'Donnell, K. Jacobs, I. Moerman, P. Demeester
- Tu\_P101** CHEMICAL-BASED AQUEOUS SURFACE TREATMENTS OF GaN STUDIED BY SYNCHROTRON RADIATION CORE-LEVEL SPECTROSCOPY  
T.F. Kuech, Jingxi Sun, K.A. Rickert, L. Zhang, J.M. Redwing, A.B. Ellis, F.J. Himpsel
- Tu\_P102** RAMAN MICROSCOPY OF LATERAL EPITAXIAL OVERGROWTH OF GaN ON SAPPHIRE  
Frederick H. Long, M. Pophristic, M. Schurman, J. Ramer, I.T. Ferguson
- Tu\_P103** DETERMINATION OF BAND STRUCTURE PARAMETERS IN NITRIDE ALLOYS FOR USE IN QUANTUM WELL CALCULATIONS  
D.J. Dugdale, S.K. Pugh, S. Brand, R.A. Abram
- Tu\_P104** CONFINED EXCITONS IN GaN-AlGaIn QUANTUM WELLS  
Pierre Bigenwald, Pierre Lefebvre, Thierry Bretagnon, Bernard Gil

# Alternative TMI™

## EPICHEM

### Worldwide Acceptance in Production Environment

- More consistent run to run 'pick-up' than any alternative method
- Nearly 100% usage readily achievable
- Reduced oxygen incorporation in high aluminum content alloys
- Efficient "TMI" delivery system
- Accurate and reproducible compositional control leads to improved lattice matching in the growth of ternary and quaternary materials
- Speedy response like other liquid metalorganics



Call today  
about  
Solution TMI™

# TMI

Epichem Ltd. (UK)  
Power Road  
Bromborough  
Wirral, Merseyside CH62 3QF  
Tel: (44) 151 884-2774  
Fax: (44) 151 884-8822  
Contact: Dr. Lesley Smith  
lesley@epichem.co.uk

www.epichem.com

Epichem Inc. (USA)  
4905 Tilghman Street  
Suite 240  
Allentown, PA 18104  
Tel: (1) 610-706-0606  
Fax: (1) 610-706-0888  
Contact: Gregory Muhr  
gmuh@epichem.com



## POSTER SESSION 3

**Wednesday July 7<sup>th</sup>**

- We\_P001** MOCVD GROWTH AND CHARACTERIZATION OF AlInGaN QUATERNARY ALLOYS  
M.E. Aumer, S.F. LeBoeuf, F.G. McIntosh, Y.C. Chang, J.F. Muth, R.M. Kolbas, S.M. Bedair
- We\_P002** THE EFFECT OF GRAIN BOUNDARIES ON ELECTRICAL CONDUCTIVITY IN THIN GaN LAYERS  
J. Salzman, I. Shalish, C. Uzan-Saguy, L. Kronik, B. Meyler, R. Kalish, Y. Shapira
- We\_P003** BEHAVIOR OF Mg IN GaN GROWN BY METAL-ORGANIC CHEMICAL VAPOR DEPOSITION  
Jia-Ming Lee, Hway-Fen Hong, Chang-Cheng Chuo, Tzer-En Nee, Jen-Inn Chyi
- We\_P004** HYDRIDE VAPOR PHASE EPITAXY FOR ALGAN/INGAN HETEROSTRUCTURES  
D. Tsvetkov, A. Nikolaev, Yu. Melnik, M. Mynbaeva, V. Dmitriev
- We\_P005** INDIUM INCORPORATION AND DROPLET FORMATION DURING MOLECULAR BEAM EPITAXY OF InGaN  
R.A. Talalaev, O.V. Bord, S.Yu. Karpov, Yu.N. Makarov
- We\_P006** (GaMg)N- NEW WIDE BAND GAP SEMICONDUCTOR  
T. Suski, P. Perlin, A. Pietraszko, M. Leszczyński, M. Boækowski, I. Grzegory, S. Porowski
- We\_P007** IMPROVED AlGaIn/GaN MATERIALS FOR MICROWAVE DEVICE APPLICATIONS  
A.E. Wickenden, D.D. Koleske, R.L. Henry, R.J. Gorman, M.E. Twigg
- We\_P008** PARTIALLY ORDERED AlGaIn ALLOYS; GROWTH AND OPTOELECTRONICS PROPERTIES  
T.D. Moustakas, E. Iliopoulos, M. Misra, D. Korakakis, K.F. Ludwig Jr., C.B. Lioutas, L.H. Robins
- We\_P009** QUANTITATIVE MODEL FOR THE MBE - GROWTH OF TERNARY NITRIDES  
Robert Averbeck, Henning Riechert
- We\_P010** STUDY OF INDIUM INCORPORATION INTO InGaIn TERNARY ALLOYS GROWN BY LOW-PRESSURE METALORGANIC VAPOR PHASE EPITAXY (LP-MOVPE)  
H.P.D. Schenk, F. Omnes, M. Leroux, P. de Mierry, B. Beaumont, P. Gibart
- We\_P011** GaN(n) / SiC(p) HETEROJUNCTIONS GROWN BY METAL ORGANIC VAPOUR PHASE EPITAXY (MOVPE)  
H. Lahrèche, S. Laügt, M. Vaille, A. Bouillé, B. Beaumont, P. Vennéguès, P. Gibart
- We\_P012** GROWTH OF Eu DOPED GaN AND ELECTROLUMINESCENCE FROM MIS STRUCTURE  
Shinichi Morishima, Takahiro Maruyama, Katsuhiko Akimoto
- We\_P013** GROWTH OF InGaIn ALLOY ON CUBIC GaN BY METALORGANIC VAPOR-PHASE EPITAXY  
Atsushi Nakadaira, Hidenao Tanaka
- We\_P014** METAL-ORGANIC VAPOR PHASE EPITAXY GROWTH AND PROPERTIES OF GaInNAs BULK AND MULTIPLE QUANTUM WELL STRUCTURES  
C. Asplund, A. Fujioka, M. Hammar, G. Landgren
- We\_P015** THE INFLUENCE OF GROWTH CONDITIONS ON THE ELECTRICAL PROPERTIES OF MAGNESIUM-DOPED GALLIUMNITRIDE GROWN BY MOVPE  
B. Kuhn, M. Welsch, M. Kessler, F. Scholz
- We\_P016** THE MICROSTRUCTURE OF Ti/Al AND TiN AS OHMIC CONTACTS ON GALLIUM NITRIDE  
P. Ruterana, G. Nouet, Th. Kehagias, Ph. Komninou, Th. Karakostas, M.A. di Forte Poisson, F. Huet, H. Morkoç
- We\_P017** MICROSTRUCTURAL INVESTIGATION OF OXIDIZED Ni/AU OHMIC CONTACT TO p-TYPE GaN  
Li-Chien Chen, Fu-Rong Chen, Ji-Jung Kai, Jin-Kuo Ho, Chang-Shyang Jong, Chien C. Chiu, Chao-Nien Huang, Chin-Yuen Chen, Kwang-Kuo Shih
- We\_P018** HIGHLY REFLECTIVE GaN/GaAlN AND AlN/GaAlN BRAGG MIRRORS GROWN BY MOLECULAR BEAM EPITAXY  
R. Langer, A. Barski, J. Simon, N.T. Pelekanos, O. Kononov, R. André, Le Si Dang
- We\_P019** INFLUENCE OF Si DOPING ON THE SUBGRAIN STRUCTURE OF GaN GROWN ON AlN/Si (111)  
S.I. Molina, A.M. Sánchez, F.J. Pacheco, R. García, M.A. Sánchez-García, E. Calleja
- We\_P020** CHARACTERIZATION OF InGaIn/GaN MQW. APPLICATION TO LED's  
F. Huet, M.A. di Forte Poisson, A. Romann, M. Tordjman, J. di Persio
- We\_P021** OPTICAL CHARACTERIZATION OF Al<sub>x</sub>Ga<sub>1-x</sub>N THIN FILM WAVEGUIDES USING PRISM COUPLING TECHNIQUE  
E. Dogheche, F. Omnes, P. Ruterana, B. Belgacem, D. Remien

<b>We_P022</b>	EVIDENCES FOR THE EXISTENCE OF A HIGH-CARRIER-DENSITY LAYER NEAR NONDOPED-GaN/a-Al <sub>2</sub> O <sub>3</sub> SUBSTRATE INTERFACE <b>A. Yamamoto, K. Ueno, K. Azuma, Y. Tsuji, A. Hashimoto</b>
<b>We_P023</b>	IMPROVEMENT OF LOW-INTENSITY ULTRAVIOLET PHOTODETECTORS BASED ON AlGa <sub>N</sub> WITH LOW THREADING DISLOCATION DENSITY <b>C. Pernot, A. Hirano, M. Iwaya, T. Detchprohm, H. Amano, I. Akasaki</b>
<b>We_P025</b>	QUANTUM YIELD of GaN and (Ga,Al) <sub>N</sub> BAND-GAP GRADED ULTRAVIOLET p-n DETECTORS <b>K.J. Plucinski, M.J. Malachowski</b>
<b>We_P026</b>	SPECTRA AND QUANTUM EFFICIENCY OF LIGHT-EMITTING DIODES BASED ON GaN HETEROSTRUCTURES WITH QUANTUM WELLS <b>A.E. Yunovich, V.E. Kudryashov, S.S. Mamakin, A.N. Turkin, A.N. Kovalev, F.I. Manyakhin</b>
<b>We_P027</b>	THERMO-CHEMICAL STABILITY OF PLASMA-DEPOSITED SILICON OXYCARBIDE THIN FILMS SUBJECTED TO POST-DEPOSITION RAPID THERMAL ANNEALING: A MODEL SYSTEM FOR UNDERSTANDING THE FORMATION OF DEVICE-QUALITY SiC-SiO <sub>2</sub> INTERFACES <b>D.M. Wolfe, G. Lucovsky</b>
<b>We_P028</b>	DIELECTRIC BRAGG MIRRORS FOR InGa <sub>N</sub> SURFACE-EMITTING LASERS <b>R.W. Martin, Taek Kim, D. Burns, I.M. Watson, M.D. Dawson, T.F. Krauss, J.H. Marsh, R.M. de La Rue, S. Romani, H. Kheyrandish</b>
<b>We_P029</b>	PREPARATION OF LOW DEFECT DENSITY GaN-Ga <sub>2</sub> O <sub>3</sub> SEMICONDUCTOR/INSULATOR INTERFACES ON POLAR GAN FACES BY 300°C REMOTE PLASMA-ASSISTED OXIDATION AND INTEGRATED INTO MOS DEVICES WITH PLASMA-DEPOSITED SiO <sub>2</sub> DIELECTRICS <b>R. Therrien, G. Lucovsky, R.F. Davis</b>
<b>We_P030</b>	ELECTRICAL PROPERTIES OF THE SI ION IMPLANTATION IN THE MG DOPED P-GAN <b>Shih-Hsiung Chang, Wei-Chih Lai, Mesio Yokoyama, Jan-Dar Guo, Jian-Shih Tsang, Chiung-Chi Tsai, Chen-Shiung Chang, Chun-Yen Chang</b>
<b>We_P031</b>	CHEMICAL AND COMPLEMENTARY ROLE OF FLUORINE IN A CHLORINE-BASED REACTIVE ION ETCHING OF Ga <sub>N</sub> <b>F. Karouta, B. Jacobs, O. Schoen, M. Heuken</b>
<b>We_P032</b>	TRANSFER OF MQW InGa <sub>N</sub> /Ga <sub>N</sub> LEDS TO COPPER SUBSTRATES USING LASER ASSISTED DEBONDING <b>P.R. Tavernier, M.C. Hanson, S.P. DenBaars, D.R. Clarke</b>
<b>We_P033</b>	ROOM TEMPERATURE CHARACTERISTICS OF InGa <sub>N</sub> /Ga <sub>N</sub> LASER DIODE GROWN BY A LOW PRESSURE MOCVD SYSTEM <b>Y. Park, B.J. Kim, Jae-Won Lee, O.H. Nam, C. Sone, H. Park, Eunsoon Oh, H. Shin, S. Chae, J. Cho, Ig-Hyun Kim, J.S. Khim, S. Cho, T.I. Kim</b>
<b>We_P034</b>	FABRICATION AND OPTICAL PROPERTIES OF III-NITRIDE MICROSTRUCTURES <b>H.X. Jiang, K.C. Zeng, D. Lun, J.Y. Lin, H. Morkoç, W. Yang</b>
<b>We_P035</b>	PHOTORESPONSE AND PHYSICAL PROPERTIES OF PHOTOCONDUCTOR AND PHOTOVOLTAIC Ga <sub>N</sub> BASED UV DETECTORS <b>V. Garber, G. Bahir, J. Salzman, A. Abare, S. Den Baars, L. Coldren</b>
<b>We_P036</b>	THE MOBILITY OF AlGa <sub>N</sub> /Ga <sub>N</sub> AND Ga <sub>N</sub> /InGa <sub>N</sub> HETEROSTRUCTURES AND DEVICE PERFORMANCE OF MODULATION DOPED FIELD-EFFECT TRANSISTORS <b>C.F. Lin, H.C. Cheng, G.C. Chi, J.I. Chyi</b>
<b>We_P037</b>	Ga <sub>N</sub> -BASED QUANTUM-EFFECT ELECTRON DEVICES USING QUANTUM INTERFERENCE OF HOT ELECTRON WAVES <b>J. Shirakashi, M. Shimizu, H. Okumura</b>
<b>We_P038</b>	HIGH-TEMPERATURE PROCESSING OF Ga <sub>N</sub> : THE INFLUENCE OF THE ANNEALING AMBIENT ON STRAIN IN Ga <sub>N</sub> <b>M. Kuball, J.M. Hayes, A. Bell, I. Harrison, D. Korakakis, C.T. Foxon</b>
<b>We_P039</b>	NANO-FABRICATION OF Ga <sub>N</sub> PILLARS USING FOCUSED ION BEAM ETCHING <b>M. Kuball, F.H. Morrissey, M. Benyoucef, I. Harrison, D. Korakakis, C.T. Foxon</b>
<b>We_P040</b>	AlGa <sub>N</sub> METAL-SEMICONDUCTOR-METAL PHOTODIODES <b>E. Monroy, F. Calle, E. Muñoz, F. Omnès</b>
<b>We_P041</b>	SCANNING ELECTROLUMINESCENCE MICROSCOPY A POWERFUL NOVEL CHARACTERIZATION TOOL FOR LIGHT EMITTING DIODES <b>P. Fischer, M. Zacharias, J. Christen, V. Schwegler, C. Kirchner, M. Kamp</b>
<b>We_P042</b>	VISIBLE BLIND AlGa <sub>N</sub> -PHOTOCONDUCTORS WITH INTEGRATED FILTERS GROWN BY PLASMA INDUCED MOLECULAR BEAM EPITAXY <b>U. Karrer, A. Dobner, O. Ambacher, M. Stutzmann</b>
<b>We_P043</b>	ROOM-TEMPERATURE CW OPERATION OF GaIn <sub>N</sub> MULTIPLE QUANTUM WELL LASER DIODES WITH OPTIMIZED INDIUM CONTENT <b>A. Tsujimura, A. Ishibashi, Y. Hasegawa, S. Kamiyama, I. Kidoguchi, R. Miyanaga, M. Suzuki, M. Kume, K. Harafuji, Y. Ban</b>

- We\_P044** AlGaIn/GaN HEMTS: SPONTANEOUS AND STRAIN-INDUCED POLARIZATION FIELDS  
J.A. Garrido, J.L. Sanchez-Rojas, A. Jimenez, E. Muñoz, F. Omnes, P. Gibart
- We\_P045** ELECTROLUMINESCENCE CHARACTERIZATION OF CUBIC GALLIUM NITRIDE p-n JUNCTIONS GROWN ON SiC/Si SUBSTRATES BY MBE  
H. Gamez-Cuatzin, J. Tardy, P. Rojo-Romeo, A. Philippe, A. Souffi, C. Bru-Chevallier, G. Guillot, E. Martinez-Guerrero, G. Feuillet, B. Daudin, P. Aboughe'nze, Y. Monteil
- We\_P046** BIAS ASSISTED, ROOM TEMPERATURE PHOTOELECTROCHEMICAL (PEC) ETCHING OF P-TYPE GaN  
M.I. Nathan, J.E. Borton, C.Cai, P. Chow, J.M. Van Hove, A. Wowchak, H. Morkoç
- We\_P047** HIGH ETCH RATE GaN PROCESSING USING AN INDUCTIVELY COUPLED PLASMA SOURCE  
M.E. Ryan, A.C. Camacho, J.K. Bhardwaj
- We\_P048** WAVELENGTH SELECTIVE AND TRUE SOLAR-BLIND GaN/AlGaIn p-i-n PHOTODIODES  
E. Tarsa, P. Kozodoy, B.P. Keller, S.B. Fleischer, U.K. Mishra
- We\_P049** ELECTRICAL AND PHOTOELECTRONIC PROPERTIES OF HEXAGONAL GaN  
R. Seitz, C. Gaspar, T. Monteiro, L. Pereira, E.Pereira
- We\_P050** FAST, LOW-LEAKAGE p-i-n (Al,Ga)N-BASED SOLAR-BLIND UV DETECTORS ON LATERALLY EPITAXIALLY OVERGROWN GaN  
G. Parish, S. Keller, E.J. Tarsa, P. Kozodoy, J.P. Ibbetson, H. Marchand, P.T. Fini, S.B. Fleischer, S.P. DenBaars, U.K. Mishra
- We\_P051** EFFECT OF AlGaIn/GaN STRAINED LAYER SUPERLATTICE PERIOD ON InGaIn MQW LASER DIODES  
M. Hansen, A.C. Abare, P. Kozodoy, T.M. Katona, J.S. Speck, U.K. Mishra, L.A. Coldren, S.P. DenBaars
- We\_P052** DEPLETION REGION OF Mg-DOPED GaN INVESTIGATED BY CAPACITANCE MEASUREMENTS  
P. Kozodoy, S.P. DenBaars, U.K. Mishra
- We\_P053** GROWTH AND STRUCTURAL CHARACTERIZATION OF InGaIn VERTICAL CAVITY SURFACE EMITTING LASERS OPERATING AT ROOM TEMPERATURE  
T. Someya, Y. Arakawa, R. Werner, A. Forchel
- We\_P054** LOW DARK CURRENT TRANSPARENT SCHOTTKY BARRIER UV DETECTORS  
G. Simin, M. Asif Khan, J.W. Yang, A. Lunev, V. Adivarahan, N. Pala, M. Shur, R. Gaska
- We\_P055** A VERY STRONG PIEZORESISTIVE EFFECT IN p-GaN  
R. Gaska, M.S. Shur, M.A. Khan, J.W. Yang, V.V. Kaminski, S.M. Soloviov
- We\_P056** MICROWAVE SIMULATION OF THE PERFORMANCE OF HIGH POWER OF AlGaIn/GaN HETEROSTRUCTURE FIELD EFFECT TRANSISTORS  
J. Deng, B. Iñiguez, M. S. Shur, R. Gaska, M. Asif Khan, J. W. Yang
- We\_P057** DESIGN AND ANALYSIS OF SOLAR-BLIND p-i-n PHOTODETECTORS EMPLOYING UNDOPED AlGaIn  
J.J. Kuek, D.L. Pulfrey, B.D. Nener, G. Parish, U.K. Mishra, E.J. Tarsa
- We\_P058** ELECTRICAL AND OPTICAL CHARACTERISTICS OF InGaIn/GaN LIGHT EMITTING DIODES  
C.F. Lin, H.C. Cheng, G.C. Chi, C.C. Chang
- We\_P059** THE INFLUENCE OF Pt IN A Ti-Al-Pt-Au OHMIC CONTACT ON n-TYPE GaN  
Z. Kachwalla, J. Wiggins, S.J. Chua, G. Li
- We\_P060** IMPROVING POWER PERFORMANCE OF AlGaIn/GaN HEMTS BY GATE-RECESS  
Y.F. Wu, C.H. Chen, S. Keller, B. Thibault, B.P. Keller, U.K. Mishra
- We\_P061** EMBEDDED DIELECTRIC GRATING DISTRIBUTED FEEDBACK NITRIDE LASER DIODE  
A.C. Abare, M. Hansen, J.S. Speck, L.A. Coldren, S.P. DenBaars
- We\_P062** GAN CLEANING BY GA DEPOSITION, REDUCTION AND RE-EVAPORATION : AN SXPS STUDY  
T.G.G. Maffei, S.A. Clark, P.R. Dunstan, S.P. Wilks, D.A. Evans, F. Peiro, P. Parbrook
- We\_P063** EFFECT OF ILLUMINATION ON THE ELECTRICAL CHARACTERISTICS OF AlGaIn/GaN FETS  
R. Dietrich, A. Vescan, A. Wieszt, H. Leier, K. S. Boutros, J. M. Redwing
- We\_P064** STRUCTURE AND OPTICAL PROPERTIES OF GALLIUM NITRIDE DOPED WITH OXYGEN  
S.E. Alexandrov, M.N. Tihomirova
- We\_P065** PHOTOCONDUCTIVITY OF AlGaIn/GaN AND GaN/InGaIn MODULATION DOPED FIELD-EFFECT TRANSISTORS  
C.F. Lin, H.C. Cheng, G.C. Chi, C.C. Chuo, J.M. Lee, J.I. Chyi
- We\_P066** STUDY OF ELECTRO-LUMINESCENCE SPECTRUM AND WAVEGUIDE TRANSPARENCY OF GaInN MULTIPLE QUANTUM WELL LASERS  
Yawara Kaneko, Ryu Shioda, Norihide Yamada, Tetsuya Takeuchi, Hiroshi Amano, Isamu Akasaki

- We\_P067** OHMIC HEATING OF LEDS DURING OPERATION: DETERMINATION OF THE JUNCTION TEMPERATURE AND ITS INFLUENCE ON DEVICE PERFORMANCE  
**V. Schwegler, C. Kirchner, M. Kamp, K.J. Ebeling, V.E. Kudryashov, A.N. Turkin, A.E. Yunovich, A. Link, W. Limmer, R. Sauer**
- We\_P068** PHOTOLUMINESCENCE CHARACTERISATION OF TRIANGULAR LATTICES OF HOLES AND PILLARS ETCHED IN GaN  
**D.Coquillat, A. Ribayrol, R.M. De La Rue, P. Girard, O. Briot, R.L. Aulombard, D. Cassagne, C. Jouanin**
- We\_P069** ACTIVATION OF Mg-DOPED GaN AT LOW TEMPERATURE UNDER ULTRA-VIOLET ILLUMINATION  
**H. Shin, J. Cho, B.J. Kim, Y. Park, J.H. Won, C.M. Kohh, T.I. Kim**
- We\_P070** ACCELERATED AGING OF InGaN/GaN LED BY ELECTRICAL STRESSING  
**K. Jacobs, J. Cheyns, W. Van der Stricht, I. Moerman, I. Harrison**
- We\_P071** DEPENDENCE OF THE DEVICE CHARACTERISTICS ON THE INTRINSIC MATERIAL PROPERTIES OF HIGH-PERFORMANCE ALGAN/GAN HEMTS  
**R.D. Dupuis, B.S. Shelton, M.M. Wong, T.G. Zhu, C.J. Eiting, D.J.H. Lambert, D.E. Lin**
- We\_P072** VISIBLE LIGHT CONTROL BY GaN PHOTONIC BAND GAPS  
**A. Barra, D. Cassagne, C. Jouanin**
- We\_P073** THEORY OF THE ELECTRONIC STRUCTURE OF Ga<sub>1-y</sub>In<sub>y</sub>N<sub>x</sub>As<sub>1-x</sub> AND RELATED ALLOYS  
**E.P. O'Reilly, A. Lindsay**
- We\_P074** THE LOW-FIELD ELECTRON MOBILITY IN BULK AlGaIn  
**B.K. Ridley**
- We\_P075** TRANSPORT PROPERTY INVESTIGATION OF TWO DIMENSIONAL ELECTRON GAS IN AlGaIn/GaN HETEROSTRUCTURES ON SAPPHIRE SUBSTRATES  
**T. Wang, Y. Ohno, M. Lachab, D. Nakagawa, T. Shirahama, S. Sakai, H. Ohno**
- We\_P076** PHOTOCONDUCTIVITY IN AlGaIn WITH DIFFERENT Al CONTENTS  
**D. Meister, M. Topf, I. Dirnstorfer, B.K. Meyer, R. Schwarz, M. Heuken**
- We\_P077** LOW RESISTIVITY MOCVD GROWN GaN:Mg AND AlGaIn:Mg LAYERS: INFLUENCE OF BUFFER LAYER ON THE HOLE CONCENTRATION AND HALL MOBILITY  
**P. Schlotter, H. Obloh, P. Hiesinger, W. Pletschen, R. Schmidt, J. Wagner**
- We\_P078** QUANTUM CAPTURE OF INJECTED ELECTRONS IN GaN-BASED LASER HETEROSTRUCTURES  
**N.A. Zakhleniuk, C.R. Bennett, V.N. Stavrou, M. Babiker, B.K. Ridley**
- We\_P079** MOSAIC STRUCTURE AND Si DOPING RELATED PECULIARITIES OF CHARGE CARRIER TRANSPORT IN III-V NITRIDES  
**N. Shmidt, V. Emtsev, A. Kryzhanovsky, R. Kyutt, W. Lundin, D. Poloskin, V. Ratnikov, A. Titkov, A. Usikov**
- We\_P080** INFLUENCE OF AlGaIn THICKNESS ON TRANSPORT PROPERTIES OF MODULATION DOPED AlGaIn/GaN SINGLE HETEROSTRUCTURES  
**B. Shen, T. Someya, Y. Arakawa**
- We\_P081** EFFECT OF NITROGEN-INDUCED MODIFICATION OF THE CONDUCTION BAND STRUCTURE ON ELECTRON TRANSPORT IN GaAsN ALLOYS  
**C. Skierbiszewski, P. Perlin, P. Wisniewski, T. Suski, W. Walukiewicz, W. Shan, J. W. Ager, E. E. Haller, J.F. Geisz, D.J. Friedman, J.M. Olson, S.R. Kurtz**
- We\_P082** ELECTRICAL PROPERTIES OF GaN BULK SINGLE CRYSTALS DOPED WITH Mg  
**E. Litwin-Staszewska, T. Suski, I. Grzegory, S. Porowski, J.L. Robert, D. Wasik, A. Witowski, D. Cote, B. Clerjaud**
- We\_P083** THEORETICAL ANALYSIS OF ELECTRICAL TRANSPORT IN UNDOPED AND Si DOPED GaN GROWN BY LP-MOVPE  
**Z. Bougrioua, J.L. Farvacque, I. Moerman, P. Demeester**
- We\_P084** HIGH-FREQUENCY HOT ELECTRON MOBILITY IN GAN  
**J.A.P. da Costa, E.W.S. Caetano, V.N. Freire**
- We\_P085** ENHANCED Mg DOPING EFFICIENCY IN Al<sub>0.2</sub>Ga<sub>0.8</sub>N / GaN SUPERLATTICES  
**P. Kozodoy, M. Hansen, S.P. DenBaars, U.K. Mishra**
- We\_P086** LOW 1/f NOISE IN AlGaIn/GaN HFETs ON SiC SUBSTRATES  
**S. Rumyantsev, M.E. Levinshtein, R. Gaska, M.S. Shur, A. Khan, J.W. Yang, G. Simin, A. Ping, T. Adesida**
- We\_P087** ELECTRON TRANSPORT IN MOVPE GAN GROWN ON SILICON NITRIDE TREATED SAPPHIRE  
**H. Eshghi, D. Lancefield, B. Beaumont, P. Gibart**
- We\_P088** INTERPRETATION OF TEMPERATURE-DEPENDENT TRANSPORT PROPERTIES OFGAN/SAPPHIRE FILMS GROWN BY MBE AND LP-MOCVD  
**J.J. Harris, K.J. Lee, I. Harrison, L.B. Flannery, D. Korakakis, C.T. Foxon, Z. Bougrioua, I. Moerman, E.J. Thrush, B. Hamilton, K. Ferhah**

- We\_P089** HOT ELECTRON ENERGY RELAXATION IN GALLIUM NITRIDE  
**A.J. Kent, P. Hawker, N.M. Stanton, C.T. Foxon, T.S. Cheng**
- We\_P090**  $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$  AND  $\text{Al}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$  BAND OFFSETS DEDUCED FROM THE SHIFT OF DEEP PHOTOLUMINESCENCE BANDS WITH  $x$   
**M. Kunzer, Ch. Manz, H. Obloh, A. Ramakrishnan, U. Kaufmann**
- We\_P091** INFLUENCE OF UV LIGHT ASSISTED ANNEALING ON OPTICAL PROPERTIES OF  $\text{InGaN}/\text{GaN}$  HETEROSTRUCTURES GROWN BY MOVPE  
**I.P. Marko, E.V. Lutsenko, V.N. Pavlovskii, G.P. Yablonskii, O. Schön, H. Protzman, M. Lünenbürger, M. Heuken, B. Schineller, K. Heime**
- We\_P092** OPTICAL CONFINEMENT AND GAIN MECHANISMS IN  $\text{GaN}$ -BASED LASING STRUCTURES  
**S. Bidnyk, T.J. Schmidt, B.D. Little, J.J. Song**
- We\_P093** EFFECTS OF CARRIER LOCALIZATION ON THE OPTICAL CHARACTERISTICS OF MOCVD-GROWN  $\text{InGaN}/\text{GaN}$  HETEROSTRUCTURES  
**Yong-Hoon Cho, T.J. Schmidt, S. Bidnyk, G.H. Gainer, J.J. Song, S. Keller, U.K. Mishra, S.P. Denbaars, D.S. Kim, W. Jhe**
- We\_P094** HOT ELECTRON DYNAMICS IN ZINCBLLENDE AND WURTZITE  $\text{GaN}$   
**J.A.P. da Costa, C.G. Rodrigues, A.R. Vasconcellos, R. Luzzi, V.N. Freire**
- We\_P095** OPTICAL SPECTROSCOPY OF  $\text{Mg}$ - AND  $\text{C}$ -RELATED DONOR AND ACCEPTOR LEVELS IN  $\text{GaN}$  GROWN BY MBE  
**S. Strauf, P. Michler, J. Gutowski, M. Fehrer, U. Birkle, S. Einfeldt, D. Hommel**
- We\_P096** MODE CONVERSION IN  $\text{GaN}$  BASED LASER STRUCTURES ON SAPPHIRE DUE TO THE BIREFRINGENCE OF THE NITRIDES  
**S. Heppel, R. Wirth, J. Off, F. Scholz, A. Hangleiter**
- We\_P097** OPTICAL GUIDED MODES AND SURFACE ACOUSTIC WAVES IN  $\text{GaN}$  GROWN ON (0001) SAPPHIRE SUBSTRATES  
**A. Khan, R. Rimeika, D. Ciplys, R. Gaska, M.S. Shur**
- We\_P098** PARTIALLY ORDERED  $\text{AlGaIn}$  ALLOYS; GROWTH AND OPTOELECTRONICS PROPERTIES  
**T.D. Moustakas, E. Iliopoulos, M. Misra, D. Korakakis, K.F. Ludwig Jr., C.B. Lioutas, L.H. Robins**
- We\_P099** EFFECTS OF CARRIER GAS TYPE ON THE PROPERTIES OF  $\text{InGaN}/\text{GaN}$  QUANTUM WELL STRUCTURES GROWN BY MOCVD  
**N. Duxbury, P. Dawson, U. Bangert, E.J. Thrush, W. Van der Stricht, K. Jacobs, I. Moerman**
- We\_P100** INCORPORATION OF DEEP DEFECTS IN  $\text{GaN}$  INDUCED BY DOPING AND IMPLANTATION PROCESSES  
**A. Krtschil, H. Witte, M. Lisker, J. Christen, U. Birkle, S. Einfeldt, D. Hommel, A. Wenzel, B. Rauschenbach**
- We\_P101** INFLUENCE OF CARBON DOPING ON THE PHOTOCONDUCTIVITY IN  $\text{GaN}$ -LAYERS  
**M. Lisker, A. Krtschil, H. Witte, J. Christen, U. Birkle, S. Einfeldt, D. Hommel**
- We\_P102** CORRELATION BETWEEN STRUCTURAL AND ELECTRICAL PROPERTIES OF MBE GROWN  $\text{GaN}$  SAMPLES  
**V. Kirchner, M. Fehrer, S. Figge, H. Heinke, S. Einfeldt, H. Selke, D. Hommel**
- We\_P103** DETECTION OF LOCALISED VARIATION IN THE ELECTRONIC PROPERTIES OF  $\text{GaN}$  GROWN BY MOCVD AND MBE USING SCANNING TUNNELING MICROSCOPY  
**B. Hamilton, K. Ferhah, J. Davidson, P. Dawson, E. Whittaker, T.S. Cheng, C.T. Foxon, Z. Bougrioua, E.J. Thrush, J.J. Harris, K.J. Lee**
- We\_P104** STRUCTURE AND ELECTRONIC PROPERTIES OF NITRIDE HETEROJUNCTIONS  
**F.A. Ponce, M.R. McCartney, D. Cherns, J. Barnard**
- We\_P105** DOPING OF GSMBE-GROWN GALLIUM NITRIDE USING SILANE  
**M. Kappers, J.L. Guyaux, J.C. Garcia**
- We\_P106** POLARIZATION INDUCED CHARGE AT HETEROJUNCTIONS OF THE III-V NITRIDES AND THEIR ALLOYS  
**Brian E. Foutz, Oliver Ambacher, Michael J. Murphy, Vinayak Tilak, Lester F. Eastman**

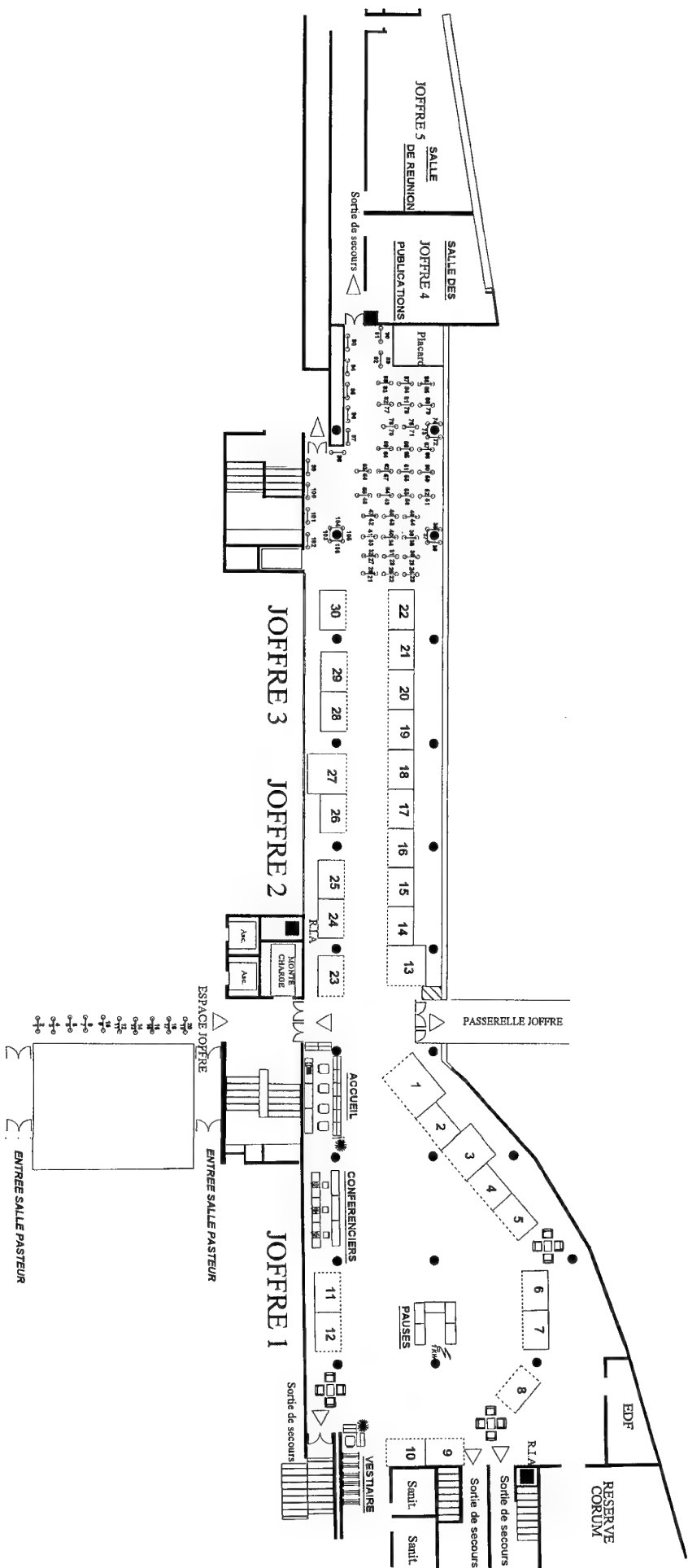
# **EXHIBIT**

---

<b>EXHIBITORS</b>	<b>BOOTHS</b>
<b>ADDON</b>	<b>11</b>
<b>AIXTRON AG</b>	<b>1</b>
<b>APRIM VIDE</b>	<b>15</b>
<b>BEDE SCIENTIFIC INSTRUMENTS</b>	<b>12</b>
<b>BICRON CRYSTAL PRODUCTS</b>	<b>30</b>
<b>BIO-RAD MICROMEASUREMENTS Ltd</b>	<b>28</b>
<b>CABURN-MDC</b>	<b>20</b>
<b>COMPOUND SEMICONDUCTOR</b>	<b>22</b>
<b>III-V<sup>s</sup> REVIEW-ELSEVIER</b>	<b>16</b>
<b>EMCORE CORPORATION</b>	<b>13</b>
<b>EPI Europe</b>	<b>4</b>
<b>FLOWLINK - MPA Industrie</b>	<b>27</b>
<b>ISA JOBIN-YVON</b>	<b>23</b>
<b>JOHNSON MATTHEY</b>	<b>14</b>
<b>M.C.S.E.</b>	<b>25</b>
<b>MATS (UK) Ltd</b>	<b>2</b>
<b>MECA 2000</b>	<b>17</b>
<b>MEDCOS</b>	<b>19</b>
<b>OXFORD UNIVERSITY PRESS</b>	<b>18</b>
<b>PB Technik AG</b>	<b>10</b>
<b>PHILIPS ANALYTICAL</b>	<b>7</b>
<b>PROBION</b>	<b>21</b>
<b>QUALIFLOW SA</b>	<b>29</b>
<b>RENISHAW PLC</b>	<b>5</b>
<b>RIBER</b>	<b>6</b>
<b>SAES GETTERS FRANCE</b>	<b>9</b>
<b>SPECTRA PHYSICS</b>	<b>26</b>
<b>SVT ASSOCIATES INC</b>	<b>24</b>
<b>THOMAS SWAN &amp; CO LTD</b>	<b>3</b>
<b>VG SEMICON</b>	<b>8</b>

The Third International conference On  
Nitride Semiconductors

EXHIBIT



**ADDON****BOOTH 11**

Address : 19, rue des Entrepreneurs - 78420 CARRIERES S/SEINE - FRANCE

Phone : +33 (0)1 39 15 39 99

Fax : +33 (0)1 39 15 56 36

E-Mail : mbecells@imaginet.fr

**AIXTRON AG****BOOTH 1**

Address : Kackertstr. 15-17 - 52072 AACHEN - GERMANY

Phone : +49 241 89 09 474

Fax : +49 241 89 09 40

E-Mail : ocs@aixtron.com

**APRIM VIDE****BOOTH 15**

Address : 104, bd. Jean Jaurès - B.P. 101 - 78804 HOUILLES Cedex - FRANCE

Phone : +33 (0)1 30 86 79 25

Fax : +33 (0)1 30 86 79 27

E-Mail : aprim\_vide@compuserve.com

**BEDE SCIENTIFIC INSTRUMENTS****BOOTH 12**

Address : Unit 13D - Bowburn South Industrial Estate - Bowburn - DURHAM DH6 5AD - UNITED KINGDOM

Phone : +44 (0)191 377 2476

Fax : +44 (0)191 377 9952

E-Mail : info@bede.co.uk

**BICRON CRYSTAL PRODUCTS****BOOTH 30**

Address : 12642-16 Poway Road #331 - POWAY CA 92064 - U.S.A.

Phone : +1 619 748 0240

Fax : +1 619 748 3410

E-Mail : rothrockm@prodigy.net

**BIO-RAD MICROMEASUREMENTS Ltd****BOOTH 28**

Address : Bio-Rad House - Maylands Avenue - HP2 7TD HEMEL HEMPSTEAD - UNITED KINGDOM

Phone : +44 (0)181 328 2290

Fax : +44 (0)181 328 2580

E-Mail : dale\_page@bio-rad.com

**CABURN-MDC****BOOTH 20**

Address : Novacité - Alpha - B.P. 2131 - 69603 VILLEURBANNE Cedex - FRANCE

Phone : +33 (0)4 78 94 56 30

Fax : +33 (0)4 72 44 34 85

E-Mail : caburn@easynet.fr

**COMPOUND SEMICONDUCTOR****BOOTH 22**

Address : Franklin Publishing - 163, Cabot Street - BEVERLY, MA 01915 - U.S.A.

Phone : +1 978 927 9994

Fax : +1 978 927 9893

E-Mail : mmeyer@compsem.com

**III-V<sup>s</sup> REVIEW-ELSEVIER****BOOTH 16**

Address : Elsevier Advanced Technology - P.O. Box 150 - Kidlington - OXFORD OX5 1AS - UNITED KINGDOM

Phone : +44 (0) 18 65 843 666

Fax : +44 (0) 18 65 843 971

E-Mail : k.wharenam@elsevier.co.uk

**EMCORE CORPORATION****BOOTH 13**

Address : Les Campagnes1C - Le Mas Neuf - 34130 MAUGUIO - FRANCE

Phone : +33 (0)4 67 29 28 86

Fax : +33 (0)4 67 29 58 01

E-Mail : pascal@emcore.com

**EPI Europe****BOOTH 4****Address :** 147 Chorley New Road - Horwich - BOLTON BL6 5QE - UNITED KINGDOM**Phone :** +44 1204 66 83 66**Fax :** +44 1204 66 84 66**E-Mail :** epieurope@compuserve.com**FLOWLINK - MPA Industrie****BOOTH 27****Address :** Z.A. Les Baronnes - BP 80017 - 34731 PRADES LE LEZ - FRANCE**Phone :** +33 (0)4 67 59 65 10**Fax :** +33 (0)4 67 59 65 11**E-Mail :** flowlink@mnet.fr**ISA JOBIN-YVON****BOOTH 23****Address :** 16-18, rue du Canal - 91165 LONGJUMEAU Cedex - FRANCE**Phone :** +33 (0)1 64 54 13 00**Fax :** +33 (0)1 69 09 93 19**E-Mail :** dominique\_lechevalier@isajy.com**JOHNSON MATTHEY****BOOTH 14****Address :** 13, rue de la Perdrix - B.P. 50240 - 95956 ROISSY CDG Cedex - FRANCE**Phone :** +33 (0)1 48 17 21 62**Fax :** +33 (0)1 48 63 27 02**E-Mail :** delogx@matthey.com**M.C.S.E.****BOOTH 25****Address :** Immeuble Le Mermoz - 38, rue de la Station - B.P. 30 - 95131 FRANCONVILLE Cedex - FRANCE**Phone :** +33 (0)1 34 15 28 22**Fax :** +33 (0)1 34 15 28 86**E-Mail :** mcse@worldnet.fr**MATS (UK) Ltd****BOOTH 2****Address :** Innovation House - Daten Park - Leacroft Avenue - Birchwood - Warrington WA3 6UT  
UNITED KINGDOM**Phone :** +44 1925 844 777**Fax :** +44 1925 844 780**E-Mail :** hamid@mats-uk.com**MECA 2000****BOOTH 17****Address :** 37, rue St Léger - 78540 VERNOUILLET - FRANCE**Phone :** +33 (0)1 39 71 71 15**Fax :** +33 (0)1 39 65 80 71**E-Mail :** meca-2000@wanadoo.fr**MEDCOS****BOOTH 19****Address :** CAP ALPHA - Avenue de l'Europe - CLAPIERS - 34940 MONTPELLIER Cedex 9 - FRANCE**Phone :** +33 (0)4 67 59 36 25**Fax :** +33 (0)4 67 59 30 10**E-Mail :** nouaoura@medcos.com**OXFORD UNIVERSITY PRESS****BOOTH 18****Address :** Great Clarendon Street - OXFORD OX2 6DP - UNITED KINGDOM**Phone :** +44 (0) 1865 267 769**Fax :** +44 (0) 1865 267 835**E-Mail :** cruicksh@oup.co.uk**PB Technik AG****BOOTH 10****Address :** Gustav-Maurer-Str. 25 - 8702 ZOLLIKON - SWITZERLAND**Phone :** +41 1 396 10 43**Fax :** +41 1 396 10 50**E-Mail :** pbt-silicon.swiss@bluewin.ch

**PHILIPS ANALYTICAL****BOOTH 7****Address :** 22, avenue Descartes - B.P. 45 - 94454 LIMEIL-BREVANNES Cedex - FRANCE**Phone :** +33 (0)1 45 1069 70**Fax :** +33 (0)1 45 10 53 71**E-Mail :** Carole.Chagnon@lim.ie.philips.com**PROBION****BOOTH 21****Address :** 196, avenue Henri Ravera - 92225 BAGNEUX - FRANCE**Phone :** +33 (0)1 42 31 74 41**Fax :** +33 (0)1 42 31 70 70**E-Mail :** maurice.quillec@wanadoo.fr**QUALIFLOW SA****BOOTH 29****Address :** Le Millénaire - 350, rue A. Nobel - B.P. 7 - 34935 MONTPELLIER Cedex 9 - FRANCE**Phone :** +33 (0)4 67 99 47 47**Fax :** +33 (0)4 67 99 47 48**E-Mail :** cpjacquemin@compuserve.com**RENISHAW PLC****BOOTH 5****Address :** Old Town - Wotton-under-Edge - Gloucestershire GL12 7DW - UNITED KINGDOM**Phone :** +44 1453 744 302**Fax :** +44 1453 844 236**E-Mail :** spectroscopy.products@renishaw.com**RIBER****BOOTH 6****Address :** 133/137, bd. National - 92503 RUEIL-MALMAISON Cedex - FRANCE**Phone :** +33 (0)1 47 08 92 50**Fax :** +33 (0)1 47 08 32 39**E-Mail :** jdesveaud@riber.fr**SAES GETTERS FRANCE****BOOTH 9****Address :** 14, rue Drouot - 75009 PARIS - FRANCE**Phone :** +33 (0)1 48 24 86 96**Fax :** +33 (0)1 48 24 10 52**E-Mail :** Pierre\_Zanger@saes-group.com**SPECTRA PHYSICS****BOOTH 26****Address :** 2-3, rue de Madrid - Centre Silic - B.P. 7408 - 38074 ST QUENTIN-FALLAVIER - FRANCE**Phone :** +33 (0)4 74 94 43 77**Fax :** +33 (0)4 74 95 50 78**E-Mail :** cminard@splasers.com**SVT ASSOCIATES INC****BOOTH 24****Address :** 7620, Executive Drive - 55344 EDEN PRAIRIE - U.S.A.**Phone :** +1 612 934 2100**Fax :** +1 612 934 2737**E-Mail :** svta@svta.com**THOMAS SWAN & CO LTD****BOOTH 3****Address :** Unit 1C - Button End - Harston -CAMBRIDGE CB2 5NX - UNITED KINGDOM**Phone :** +44 1223 872 282**Fax :** +44 1223 871 714**E-Mail :** ndgerrard@thomasswan.co.uk**VG SEMICON****BOOTH 8****Address :** The Birches Industrial Estate - Imberhorne Lane -EAST GRINSTEAD -West Sussex RH12 1XZ - UNITED KINGDOM**Phone :** +44 1342 325 011**Fax :** +44 1342 315 800**E-Mail :** sbarton@vgsemicon.com

# Did you know Thomas Swan...

have specifically designed a  
close-coupled showerhead  
(CCS) MOCVD reactor for GaN

Did you know that CCS

- maximises reagent utilisation
- enables excellent uniformity of thickness and alloy composition
- delivers monolayer abruptness of interfaces
- enables high Indium and Aluminium content alloys
- delivers on process stability and reproducibility
- enables high linear rates of growth  $<8\mu\text{m/hr}$
- minimises and improves reactor efficiency



CCS is available  
at 1x2", 3x2"  
and 6x2" for GaN

CCS The MOCVD  
technology of  
choice for GaN



Thomas Swan & Co. Ltd.

Unit 1c, Button End, Harston,  
Cambridge, CB2 5NX UK

Tel: +44 (0)1223 872282 Fax: +44 (0)1223 871714

E-mail: [sales@thomasswan.co.uk](mailto:sales@thomasswan.co.uk)

**The Organizing Committee thanks for their help :**

Le Centre National de la Recherche Scientifique

Le Commissariat à l'Energie Atomique

Le Conseil Général de l'Hérault

Le Conseil Régional du Languedoc-Roussillon

La Délégation Générale à l'Armement

Le District de l'Agglomération de Montpellier

The European Research Office of the US Army

L'Université Montpellier II

La Ville de Montpellier

**as well as**

ADDON

AIXTRON AG

APRIM VIDE

BEDE SCIENTIFIC INSTRUMENTS

BICRON CRYSTAL PRODUCTS

BIO-RAD MICROMEASUREMENTS LTD

CABURN-MDC

COMPOUND SEMICONDUCTOR

CREE RESEARCH INC

ELECTRON DEVICES SOCIETY

ELSEVIER III-Vs REVIEW

EMCORE CORPORATION

EPI Europe

EPICHEM LTD

FLOWLINK-MPA INDUSTRIE

ISA JOBIN-YVON

JOHNSON MATTHEY

MATS (UK) LTD

M.C.S.E.

MECA 2000

MEDCOS

MORTON METALORGANICS

NICHIA CHEMICAL INDUSTRIES

OXFORD UNIVERSITY PRESS

PB TECHNIK AG

PHILIPS ANALYTICAL

PicoGIGA

PROBION

PROMECOME ELECTRONICS

QUALIFLOW SA

RENISHAW PLC

RIBER

SAES-GETTERS FRANCE

SHARP LABORATORIES OF EUROPE LTD

SPECTRA PHYSICS

SPRINGER-VERLAG

SVT ASSOCIATES INC

THOMAS SWAN & CO LTD

THOMSON CSF

VG SEMICON

**PAYMENT OF THE REGISTRATION FEES**

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (C.N.R.S.)

Délégation Languedoc Roussillon

1919, route de Mende

34293 MONTPELLIER Cdx 5 - France

Tel. : + 33 (0)4 67 61 34 72 - Fax : + 33 (0)4 67 61 35 59

E-mail : [tferr@dr13.cnrs.fr](mailto:tferr@dr13.cnrs.fr)

**SCIENTIFIC SECRETARIAT**

Secretariat ICNS3

G.E.S. - Case Courrier 074

Université Montpellier II

34095 MONTPELLIER Cdx 5 - France

Tel. : + 33 (0)4 67 14 37 56

Fax : + 33 (0)4 67 14 37 60

E-mail : [lefebvre@ges.univ-montp2.fr](mailto:lefebvre@ges.univ-montp2.fr)

**ORGANIZATION & ACCOMMODATION**

Sté INTERNATIONALE DE  
CONGRES ET SERVICES

337, rue de la Combe Caude

34090 MONTPELLIER - France

Tel. : + 33 (0)4 67 63 53 40

Fax : + 33 (0)4 67 41 94 27

E-mail : [algcsi@mnet.fr](mailto:algcsi@mnet.fr)